Rural Electrification Administration
Telephone Engineering and Construction Manual

Section 690
Issue No. 1
Addendum No
June 1962

JOINT USE OF POLES

Purpose: This addendum provides additional information for the desig
of cable plant in joint-use construction.

Contents

1. SCOPE

1.01 The information herein is for use in the design of joint-use of cable weighing 1.5 pounds per foot or more. It suppleme Addendum No. 2 to REA TE & CM-690, "Joint Use of Poles" whi is limited to design where the cable weighs 1.0 pound per f or less.

2. GENERAL

2.01 The design engineer must determine the clearances and point of attachment to power poles for cables which exceed 1.0 po per foot. The solution for a specific project can be worke out graphically as explained herein. The method can be use for making rapid checks to determine whether or not the pow poles will provide vertical clearances required by the NESC rules with a desired cable on them.

2.02 In urban areas where spans usually are 150 feet or less, it may not be necessary to use this graphic method. In such spans the power wire sags and the cable sags are considerab

less than in the long spans usually found in rural areas. In short spans the cable sags usually will exceed the power wire sags. By the use of the clearance rules stated in the following paragraphs, the required separations for these short spans can be quickly determined.

2.03 Reference should be made to REA TE & CM-630, "Design of Aerial Cable Plant" for information as to the grade of galvanizing or other coating on the suspension strand for use in areas where corrosive atmosphere exist.

3. JOINT USE CLEARANCE AND SEPARATION RULES

3.01 In joint-use construction certain clearance and separation rules are stated in the National Electrical Safety Code (NESC). A sixth edition of the Code was issued by the National Bureau of Standards, dated November 1, 1961, as Handbook 81. This can be purchased from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., priced at $1.75 per copy. In those States where the fifth edition is in effect by law, it must be continued as a guide until the sixth edition is adopted. Certain States have rules that are more stringent than the NESC rules and these must be complied with. The NESC rules of the sixth edition are referred to herein.

3.02 The NESC rules make distinctions as to clearances and separations depending on whether the power line voltage is below 8700 volts to ground or above this voltage. One set of rules applies where the power line supports secondary power wires and a different set where it does not.

3.03 The rules applicable to cable on power poles which do not support secondary power wires are as follows: (See Figure 1 in TE & CM-690 which shows certain joint-use separation requirements).

a. For spans exceeding 150 feet, the attachment point of the strand to power poles must be at least 40 inches (for practical purposes 3.5 feet can be assumed) below the lowest power wire attachment point, usually the power neutral wire, for power lines not exceeding 8700 volts to ground and at least 60 inches if the power voltage exceed 8,700 volts but does not exceed 15,000 volts to ground.

b. The minimum vertical separation required at supports between the strand and grounded non-current carrying power system equipment, such as transformer cases, is 30 inches.

c. The final unloaded sag of a cable at 60° F. must comply with the ground clearance rules of the NESC which are stated in REA TE & CM-602, "Clearances."

d. NESC Rule 238 B 3(c). "For span lengths in excess of 150 feet, vertical separation at the pole between open supply conductors and communication cables or conductors shall be adjusted so that under conditions of 60° F, no wind and final unloaded sag, no supply conductor of 750 volts or less shall be lower in the span than a straight line joining the points of support of the highest communication cable or conductor, and no supply conductor of over 750 volts but less than 50,000 volts shall be lower in the span than 30 inches above such a straight line." This means the strand line of sight attachment points must be at least 30 inches below the low point in the sag of the phase wire in Figure 1, but the multi-grounded neutral wire may sag below this line of sight of the strand.

e. The initial sag of a bare strand when installed or a cable on strand must provide at least 30 inch clearance between the lowest power wire (in this case usually the neutral wire) and the strand at 60° F. with no wind for for power lines not exceeding 8700 volts to ground and 45 inch clearance if the power line exceeds 8700 volts to ground.

3.04 The rules applicable to cable on power lines which <u>do</u> support secondary wires are as follows: (See Figure 2 in REA TE & CM-690 which shows certain joint-use separation requirements.)

a. Same as par. 3.03a, above.
b. Same as par. 3.03b, above.
c. Same as par. 3.03c, above.
d. Same as par. 303d, above. However, this means in this case that the strand line of sight must be not higher than the low point of sag of the lowest secondary wire which is in the class of power wires of 750 volts or less.
e. The initial sag of a bare strand when installed or a cable on strand must provide at least 30 inch clearance between the lowest power wire (in this case the lowest secondary wire) and the strand at 60° F. with no wind for power lines not exceeding 8700 volts to ground and 45 inch clearance if the power line exceeds 8700 volts to ground.

3.05 When suspension strand is installed, it has much less sag than after a cable is placed on it. Power wires have considerable sag in long span rural construction. Consequently,

it may be necessary to attach the strand temporarily at a point below its final attachment point to prevent contact with power wires above it on the same poles until cable is placed on the strand. The temporary means of attachment can be by driving lag bolts into the poles or by placing other suitable support hardware at proper height to give temporary clearance. Washers can be placed on the bolts and the strand can be placed on the bolts between the washers and the poles. The strand then can be secured to the poles with 0.109 inch steel line wire to hold it temporarily until after the cable is supported by the strand. The strand and cable then can be raised to the throughbolts and the strand attached by three bolt clamps in the standard manner.

3 IN THE PREPARATION OF FIGURE 1 - POWER LINE WITHOUT SECONDARIES NO. 4 7/1 ACSR WIRES)

Figure 1 is a graphic solution for a joint-use situation in which it is assumed that the following factors apply:

a. Ruling span - 387 feet (Information from power company)
b. Average span - 350 feet (Information from power company)
c. Power line voltage - 8700 volts to ground (Information from power company)
d. Power wires - No. 4 7/1 ACSR (Information from power company)
e. Cable weight per foot - 1.5 lb. (Table 1 TE & CM-630, "Design of Aerial Cable Plant.") This table shows that 100-pair 19-gauge, 200-pair 22-gauge, and 300-pair 24-gauge plastic cables for aerial use weigh in the order of 1.5 lb. per foot.
f. Power line poles - 35-foot (Information from power company)
g. Configuration of power wires on the poles. (See RD Figure 16 in REA TE & CM-690 which is the pole head configuration drawing.)
h. Ground clearance desired - 14 feet for the cable at final unloaded sag at 60° F.
i. Storm loading district - heavy

Other data required in the graphic solution, available in REA documents, include:

a. Strand size required for 1.5 lb. per foot cable for 350-foot spans in the heavy loading district. The Sag Charts 1 and 2 in REA TE & CM-630 show that a 10M strand is required for 1.5 lb. cable for 350-foot spans in the heavy storm loading district.

strand stringing (initial) sag at 60° F. for 350-foot This is approximately 2 feet on Sag Chart 2 herewith.

c. The initial sag of the 1.5 lb. cable on 10M strand for 350-foot spans. This is approximately 7 feet shown on Sag Chart 5 herewith.

d. The final unloaded sag of the 1.5 lb. cable at 60° F. on 10M strand for 350-foot spans in the heavy loading district. This is approximately 8.5 shown on Sag Chart 4 in REA TE & CM-630.

e. The final unloaded sag of the No. 4 7/1 ACSR power wire at 60° F. for a 350-foot span in the heavy loading district. This is approximately 7 feet as shown on Figure 8 of Addendum No. 2 to REA TE & CM-690.

f. The attachment distance in feet above ground of the power line neutral (lowest) wire. This is shown to be 25.5 feet on RD Figure No. 16 in REA TE & CM-690.

4.03 Figure 1 herewith is drawn using the rules and data presented in paragraphs 3.03, 4.01, and 4.02 above. It shows that the desired 14 foot ground clearance cannot be obtained on 35-foot power poles. Sag Chart 4 of REA TE & CM-630 shows that a cable weighing 0.75 lb. per foot is the heaviest that can be used in this situation on 10M strand and still comply with the required rules as it would have the 6-foot final unloaded sag. Table 1 in REA TE & CM-630 shows that 50-pair 19-gauge, 100-pair 22-gauge, and 150-pair 24-gauge plastic cables weigh in the order of 0.75 lbs. per foot.

4.04 Sag Chart 7 of REA TE & CM-630 shows that the 6-foot final unloaded sag of a 1.5 lb. per foot cable on a 16M strand would provide the desired 14-foot ground clearance in this situation.

4.05 Figure 1 shows that the strand would require temporary location when placed because it would not clear the neutral wire by 30 inches. See paragraph 3.05.

4.06 In joint use on 35-foot power line poles without secondaries, the maximum final unloaded sag of a cable cannot exceed eight feet if 14-foot ground clearance is required in any storm loading district for any span length. This is based on the fact that the phase wire is 29.5 feet above ground, the neutral wire is four feet below this, and the strand attachment point must be at least forty inches (3.5 feet for practical purposes) below the neutral wire which makes it 7.5 feet below the phase wire point of attachment. This means the strand cannot be placed higher than 22 feet above ground. The 14-foot ground

clearance leaves 8 feet for cable sag. This fact can be used as a check on the graphic solution of such problems as shown in Figure 1.

5. STEPS IN THE PREPARATION OF FIGURE 2 - POWER LINE WITH SECONDARIES (AND 4 7/1 ACSR WIRES)

5.01 Figure 2 is drawn using the same assumptions as used in making Figure 1 plus the fact that the lowest secondary wire is assumed to be 3 feet below the multigrounded neutral wire, and that an 8-foot ground clearance is permissible instead of 14-foot which it is evident cannot be obtained here. The line of sight rule of par. 3.04 d. applies in this situation, i.e., the line of sight must be tangent to the low point of sag of the lowest secondary wire. The other data used is the same as used in Figure 1.

5.02 The final point of strand attachment to the poles would be 7 feet below the lowest secondary (which is the final unloaded sag of this secondary wire). This would place the strand 15.5 feet above ground, which is 14 feet below the top phase wire. The final unloaded sag of the cable which is 8.5 feet will make the ground clearance 7 feet where 8 feet is desired. A cable having a final unloaded sag of 7 feet would be the heaviest permissible for the span lengths assumed. Sag Chart 4 of REA TE & CM-630 shows that a cable weighing 1.0 lb. per foot which has approximately 7 foot final unloaded sag at 350 feet would be the maximum size permissible on 10M strand in the heavy storm loading district. Table 1 in REA TE & CM-630 shows that 75-pair 19-gauge, 150-pair 22-gauge, and 200-pair 24-gauge plastic cables weigh in the order of 1.0 lb. per foot.

5.03 To obtain 8 foot ground clearance, the 1.5 lb. cable must not exceed 7.5-foot final unloaded sag (90 inches) or less. Use of 16M strand would be necessary. Sag Chart 7 of REA TE & CM-630 shows that with the 16M strand the final unloaded sag of 1.5 lb. cable is approximately 6 feet which would result in 9.5 foot ground clearance.

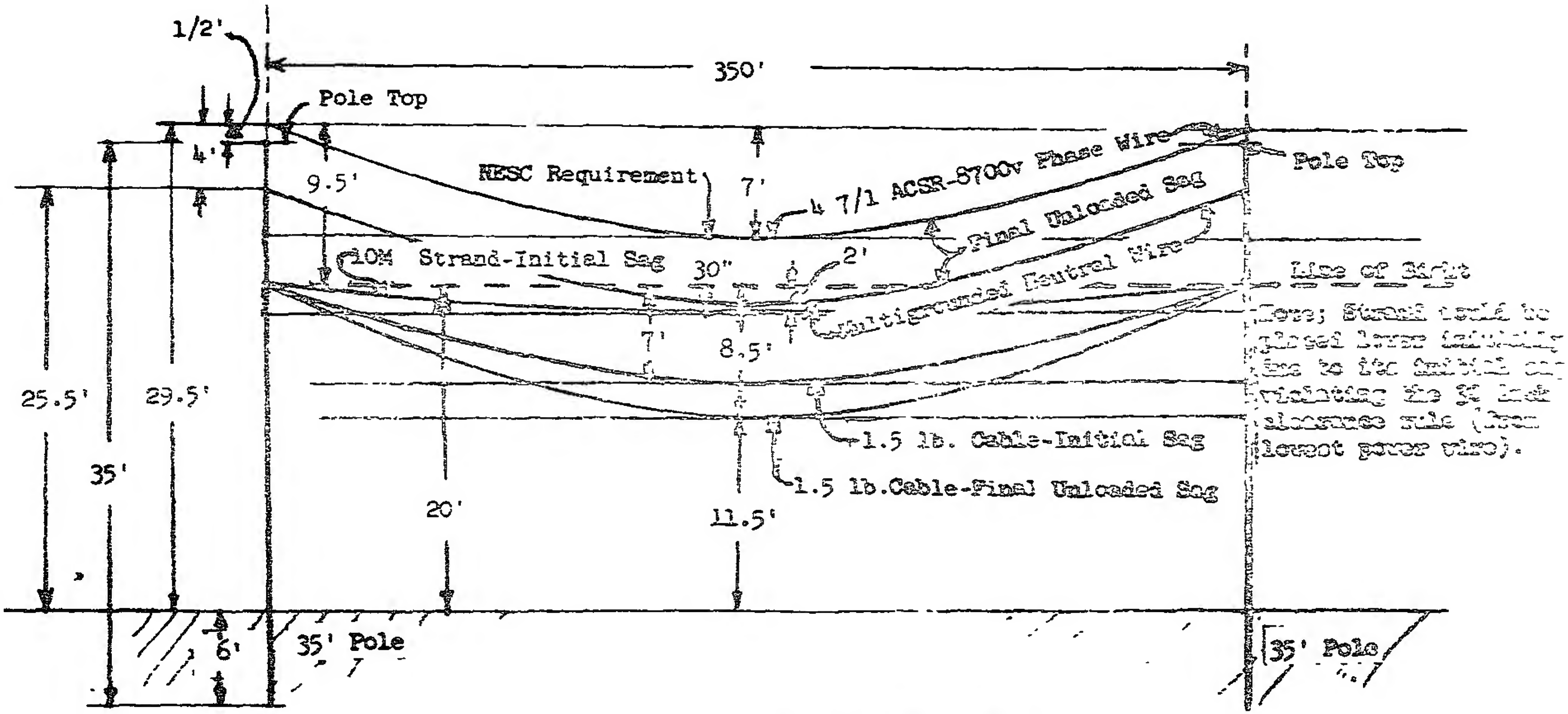
5.04 Figure 2 shows that the strand would require temporary location when placed because it would not clear the lowest secondary wire by 30 inches. See paragraph 3.05.

5.05 In joint use on 35-foot power line poles with secondaries, the sum of the final unloaded sag of any kind of power wires plus the final unloaded sag of the cable cannot exceed 8.5 feet if 14-foot ground clearance is desired in any storm loading district for any span length. The top phase wire is attached 29.5 feet above ground. The lowest secondary is attached 7 feet below it or 22.5 feet above ground. The cable must be attached tangent

to the low point of secondary sag (assuming level ground). The ground clearance uses 14 feet of this 22.5 feet leaving 8.5 feet as the greatest possible sum of the secondary final unloaded sag and cable unloaded sag.

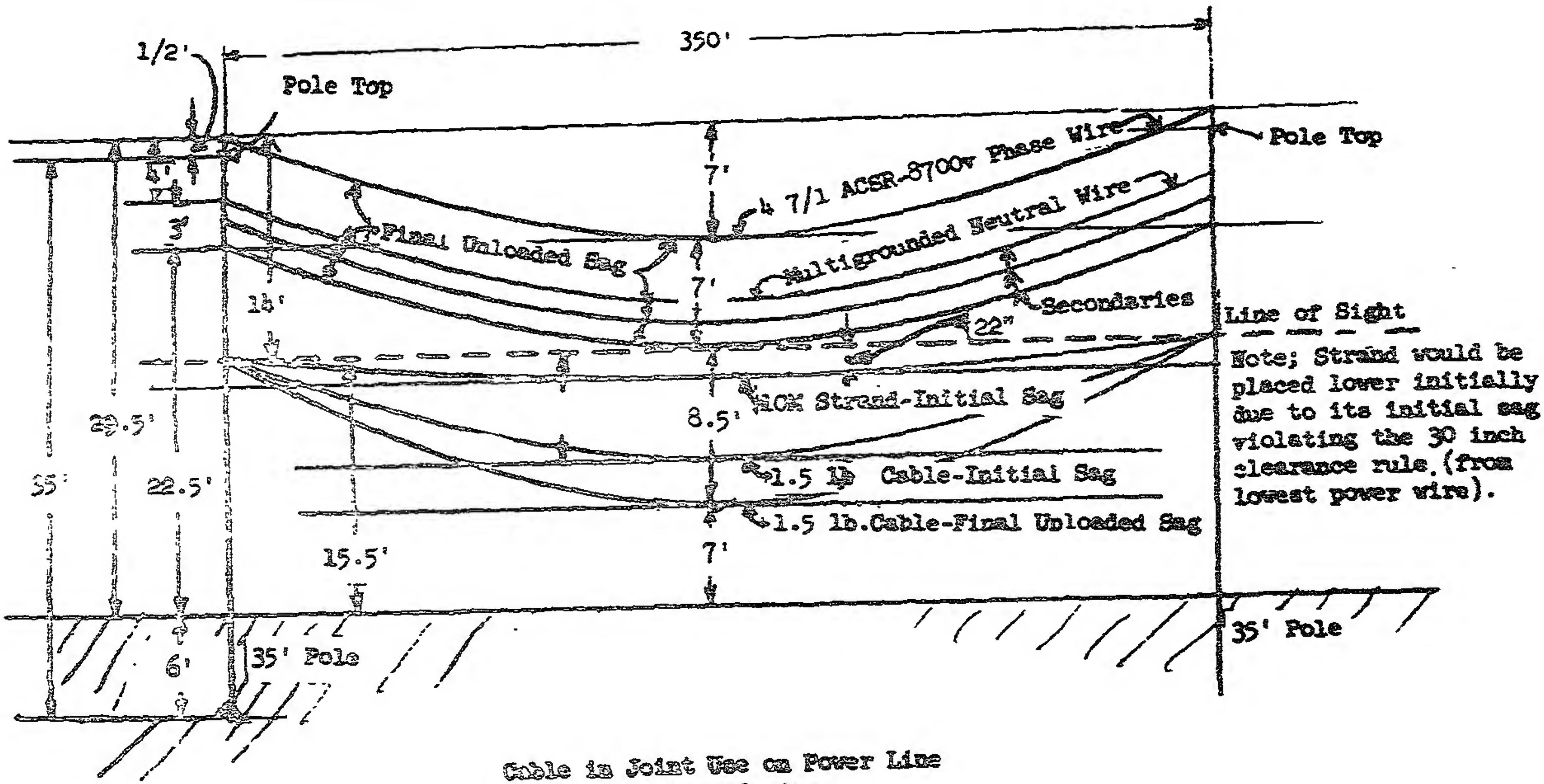
6. DATA FOR POWER LINES USING OTHER THAN 4 7/1 WIRE

6.01 Final unloaded sag data for No. 6A and No. 8A copperweld and No. 6 HD copper power line wire are given on Sag curves in Addendum 2 to REA TE & CM-690.



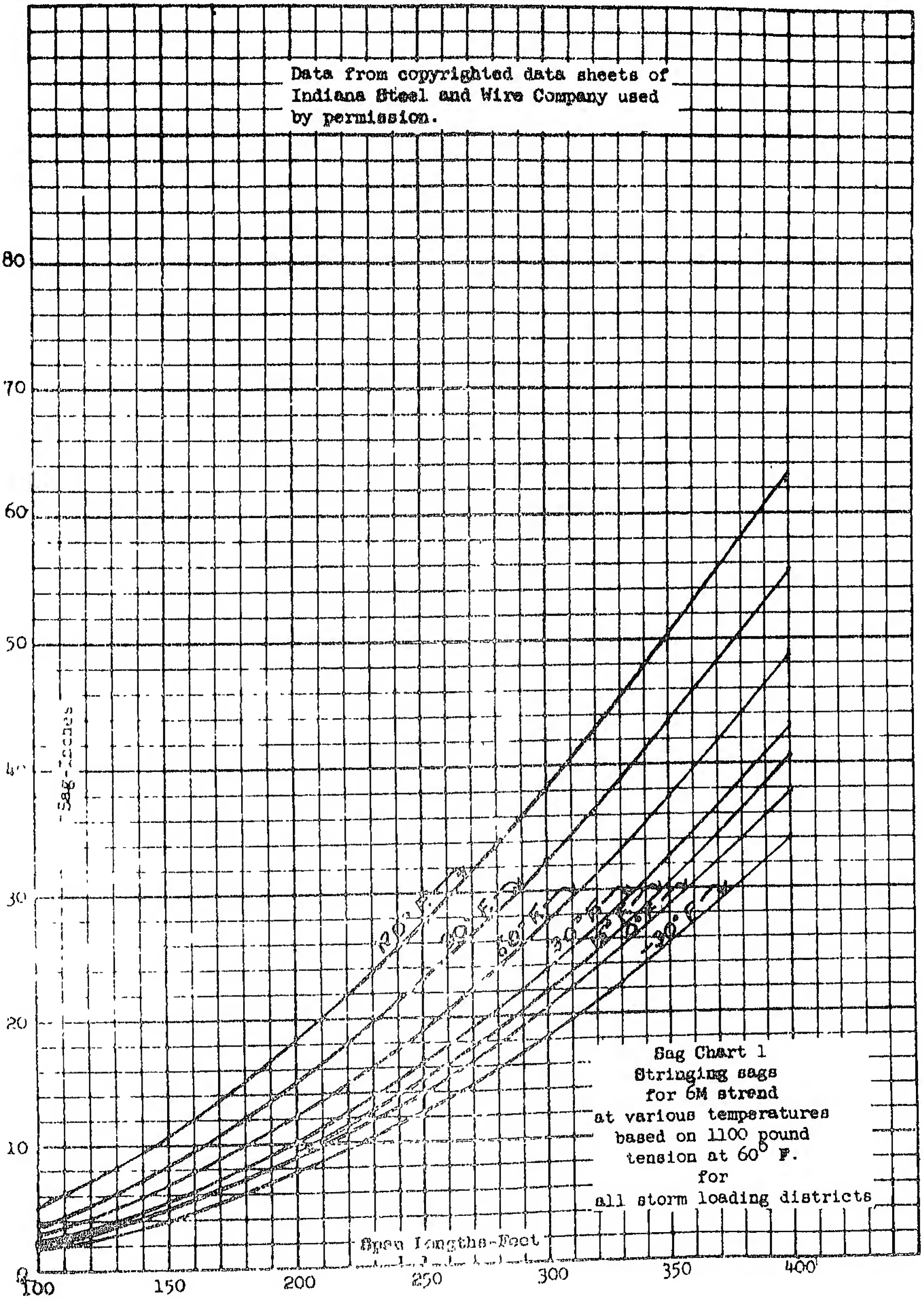
Cable in Joint Use on Power Line
with no Secondaries

FIGURE 1



Cable in Joint Use on Power Line
with Secondaries

FIGURE 2



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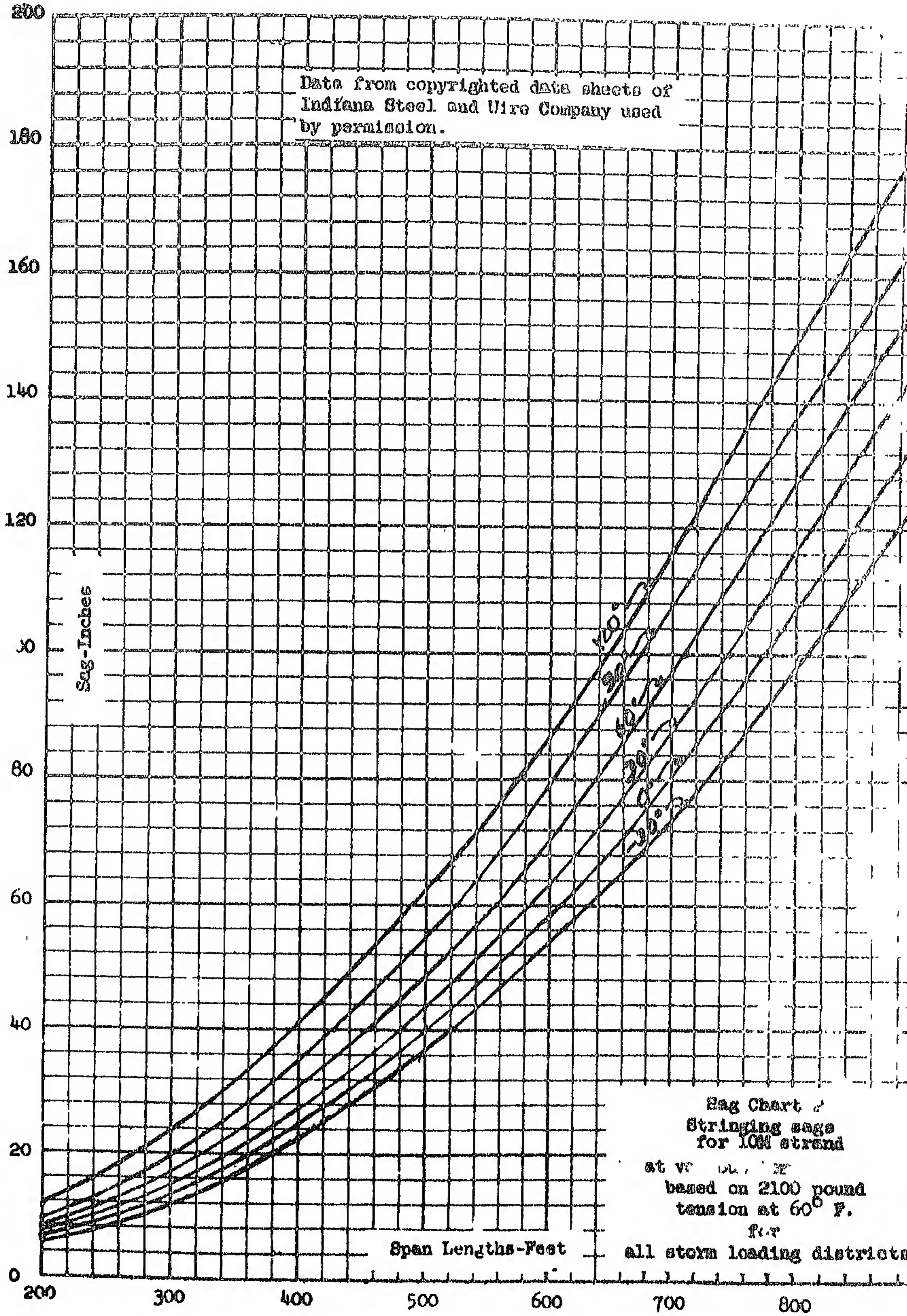
Sag Chart 1
Stringing sags
for 6M strand
at various temperatures
based on 1100 pound
tension at 60° F.
for
all storm loading districts
Sag-Inches
Span Lengths-Feet
0
10
20
30
40
50
60
70
80
100
150
200
250
300
350
400



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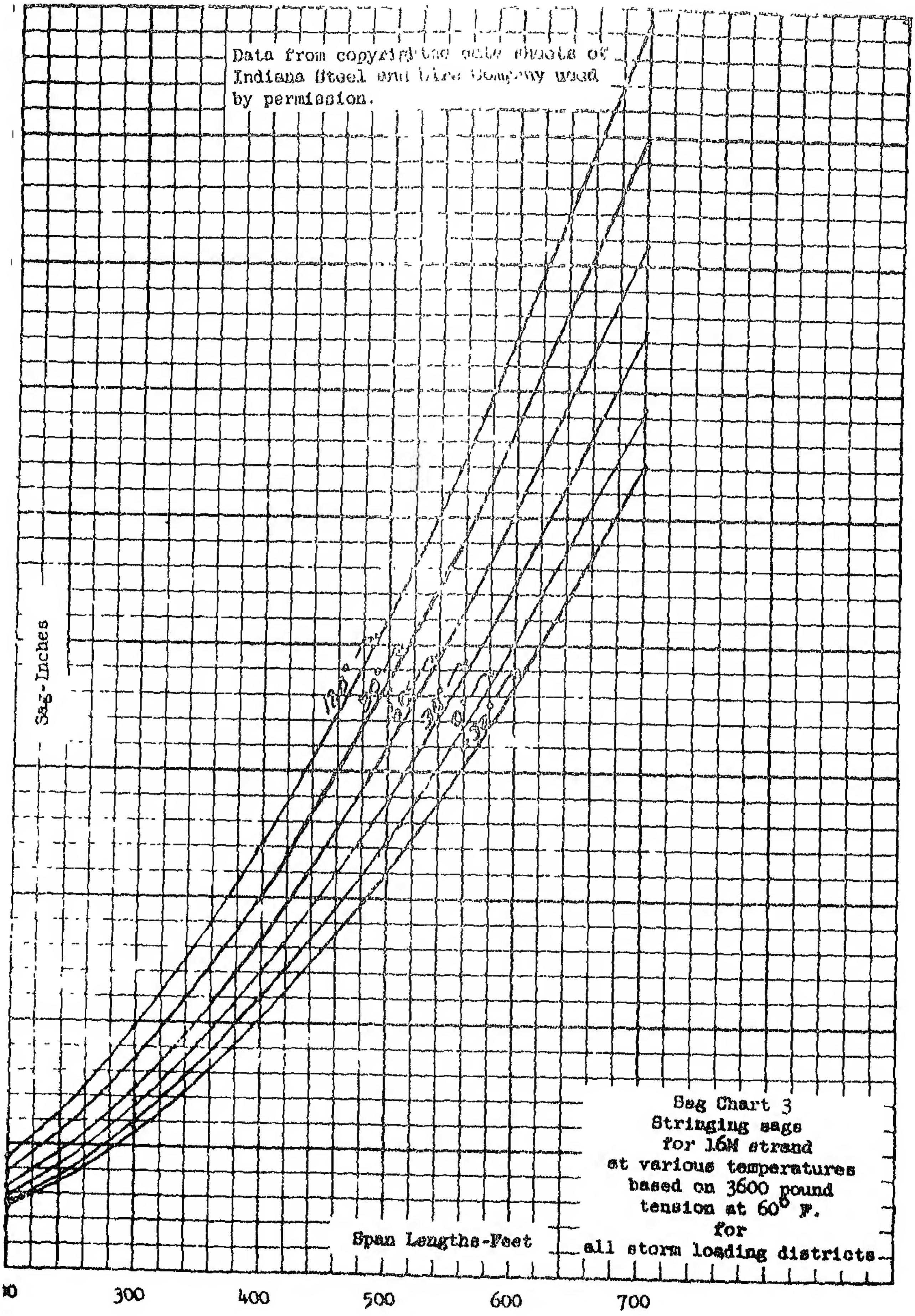
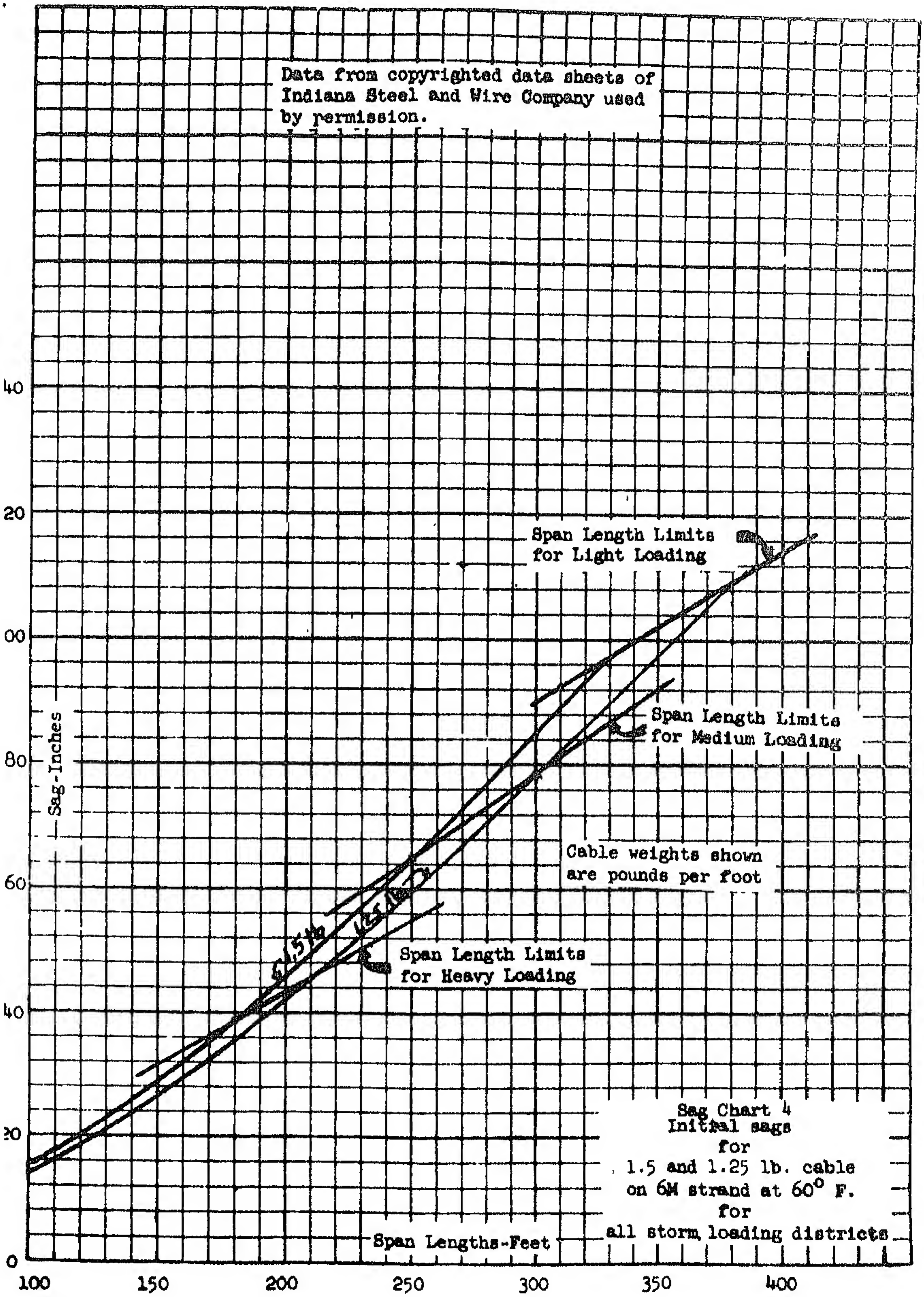
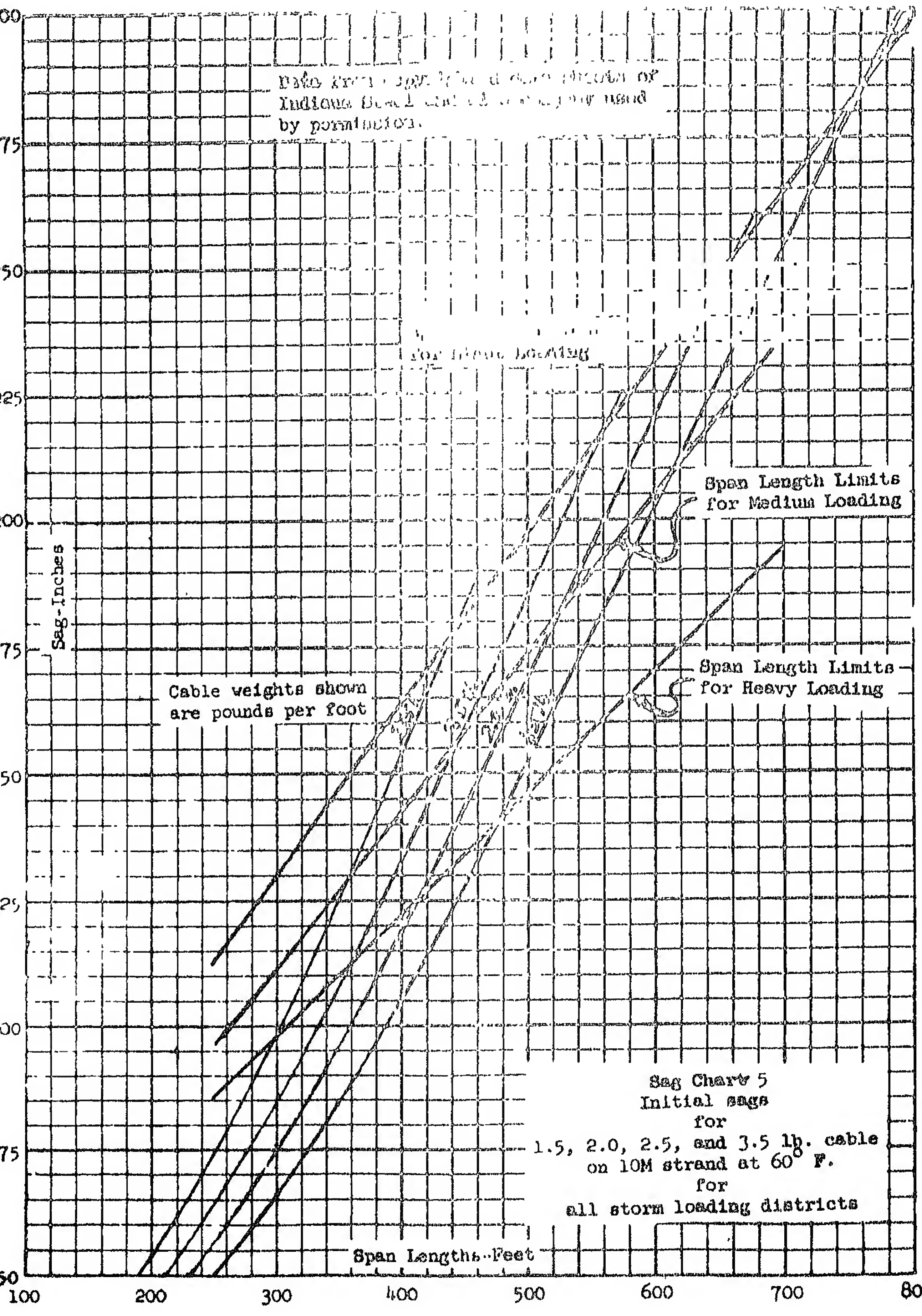
Sag-Inches
Span Lengths-Feet
Sag Chart
Stringing sags for 10M strand
based on 2100 pound tension at 60° F.
all storm loading districts
200
180
160
140
120
80
60
40
20
0
200
300
400
500
600
700
800



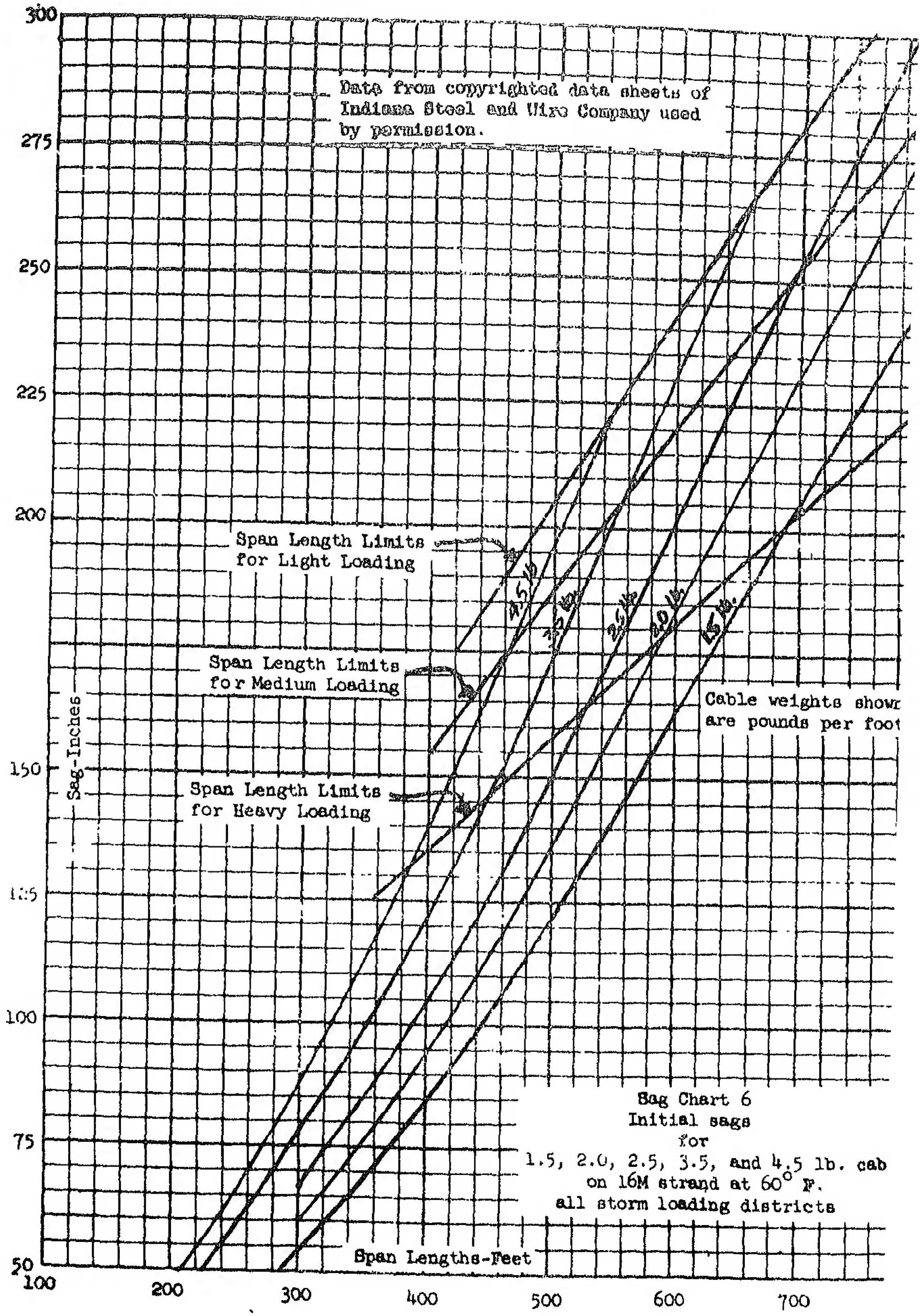
Sag Chart 3
Stringing sags
for 16M strand
at various temperatures
based on 3600 pound
tension at 60° F.
for
all storm loading districts



Sag Chart 4
Initial sags
for
1.5 and 1.25 lb. cable
on 6M strand at 60° F.
for
all storm loading districts



Span Length Limits
for Medium Loading
Span Length Limits
for Heavy Loading
Cable weights shown
are pounds per foot
Sag-Inches
Span Lengths-Feet
Sag Chart 5
Initial sags
for
1.5, 2.0, 2.5, and 3.5 lb. cable
on 10M strand at 60° F.
for
all storm loading districts
100
200
300
400
500
600
700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Indiana Steel and Wire Company used
by permission.
Span Length Limits
for Light Loading
Span Length Limits
for Medium Loading
Span Length Limits
for Heavy Loading
Cable weights shown
are pounds per foot
Sag-Inches
300
275
250
225
200
150
125
100
75
50
Span Lengths-Feet
100
200
300
400
500
600
700
Sag Chart 6
Initial sags
for
1.5, 2.0, 2.5, 3.5, and 4.5 lb. cab
on 16M strand at 60° F.
all storm loading districts

JOINT USE OF POLES

Purpose: The purpose of this addendum is to include joint use by telephone borrowers of poles carrying 14.4/24.9 kv multigrounded neutral type of power distribution circuits. This addendum supplements Section 690 by expanding its scope.

Additions:

1. Scope

1.1 This addendum discusses considerations involved in joint use of poles for rural power and telephone circuits under conditions where:

1.11 Telephone circuits are open wire.

1.12 Electric power circuits are of the multigrounded neutral type whose voltage from phase to ground exceeds 8700 volts but does not exceed 15,000 volts.

2. General

2.1 Joint use by telephone borrowers of poles carrying 14.4/24.9 kv multigrounded neutral type of power distribution circuits is recommended, if all requirements for such joint use as set forth below can be met and if, after careful consideration of all factors involved, joint use appears to be economically and technically desirable, or if it is the best engineering solution to difficult right-of-way or construction problems.

2.2 Section 690 of the TE & CM discusses the considerations involved in joint use of poles for rural power and telephone circuits involving open wire telephone circuits and multigrounded neutral power circuits whose voltage to ground does not exceed 8700 volts. It is the purpose of this addendum to set forth the considerations involved in joint use of poles involving open wire telephone circuits and multigrounded neutral power circuits whose voltage to ground exceeds 8700 volts, but does not exceed 15,000 volts. Joint use with a multigrounded neutral power system is assumed throughout the discussion that follows

2.3 The omission of cable construction from Issue No. 1 of Section 690 was to expedite issuance of the section and in no way implies that such joint use id not desirable. Joint use of poles for electric power circuits and telephone cables will be covered in a later addendum to this section.

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Addendum No. 3 6/58 Incorporated

2.4 The requirements of this document for 14.4 kv joint use [illegible] on conformity with the applicable provisions of the National Electrical Safety Code and the Rural Pole Line Practices for Supply and Communication Circuits" as were the requirements described [illegible] for lower voltage in Paragraphs 2.2 and 2.3 of Section 690, lower voltage joint use.

2.5 Strength, ground clearance and climbing space requirements for 14.4 kv joint use will be the same as now required by Section 690 for lower voltage joint use.

3. Separation Requirements Between Electric and Telephone Circuits

3.1 For voltages between phase wire and neutral of 15 kv or less, the multigrounded neutral is classified as being a 0-750 volt conductor. Therefore for single phase lines of 14.4/24.9 kv systems, the minimum separations between neutral or lowest secondary conductors and telephone conductors within span and at the pole are the same for single phase 14.4 kv as for single phase 7.2 kv; namely, 40 inches at the pole and 30 inches within span. Therefore the "Vertical Separation Tables" now included in Section 690 can be used for single phase 14.4 kv joint use. In Montana, South Dakota and Arizona, state laws have been passed which classify the neutral as being from 0-750 volts regardless of the number of phases. This permits the separation tables of Section 690 to be used on "V" phase and 3-phase lines having a potential of 24.9 kv between phases, in these three states. In other states, at the present time basic separations from the multigrounded neutral or lowest secondary wire of 60 inches at the pole and 45 inches within-span must be maintained on "V" and 3-phase 14.4/24.9 kv lines.

4. Electrical Protection Requirements

4.1 Electrical protection in this instance as in the case of joint use with power circuits not exceeding 8700 volts to ground, is based on coordinated electrical protection schemes on the power and telephone systems. The definition of "coordinated electrical protection" is given in Paragraph 6.1, Section 690.

4.2 The basic telephone protection devices for 14.4 kv joint use are the same as are now used in 7.2 kv joint use. The short circuit currents, recloser, characteristics, and fusing of each 14.4 kv distribution line which is being considered for joint use must be checked against the time-current characteristics of the power contact protectors which would be used on the telephone circuits. This is necessary in order to determine if they are capable of handling the probable amount of energy to which they might be subjected in the event of a contact between a power phase conductor and a telephone conductdr. The time-current characteristic of a typical power contact protector is shown in Figure 2 of Section 820, Issue No. 2.

4.3 The short circuit current of a 14.4 kv line as compared with an equivalent 7.2 kv line supplied by substations having equal kva ratings is roughly half that of the 7.2 kv line at, or near the substation. A cross-over point is usually reached some distance out on the line, beyond which the short circuit current of the 14.4 kv line would be greater than that of the 7.2 kv line, but less than the value at the substation. On the substation side of the cross-over point, there is usually an adequate difference between the maximum normal load currents and fault current to make it easy to obtain reliable and positive operation of reclosers on fault currents, without false operation on unusually high nonfault load currents. The duty on the power contact protectors on the substation side of the cross-over point would be less at 14.4 kv than on the equivalent 7.2 kv line. Therefore it is possible to handle somewhat higher kva ratings with 14.4 kv systems without exceeding the safe current-carrying capacity of the power contact protectors. Beyond the cross-over point, the higher short curcuit currents of the 14.4 kv system insure more positive operation of reclosers than is possible in an equivalent 7.2 kv system and there is little danger of burning out the power contact protectors. Although in some instances, as indicated above, the duty on the power contact protectors would be less in a 14.4 kv system than in a 7.2 kv system of the same kva rating, it is recommended that they be installed at intervals of 20 ohms of telephone conductor (one wire) as now specified in Section 820 of the TE & CM.

5. Electric Induction at Fundamental Frequency

5.1 For the same average cross section configuration of wires, the open circuit electrically induced voltage in telephone circuits on a joint use power line would be almost twice as high in a 14.4 kv system as in a 7.2 kv system. Therefore approximately twice as many drains would be required on telephone circuits on a 14.4 kv line in order to reduce the induced voltage to the same level as that from the 7.2 kv line. While it is desirable to hold the induced voltage on all lines to the practicable minimum, there is no hard and fast limiting value of voltage that would be considered tolerable. Ringing, personnel, and economic considerations are also involved. Drainage units should therefore be installed in accordance with the requirements of Section 820.

6. Magnetic Induction at Fundamental Frequency - Short-Circuit Conditions

6.1 The current in a power fault to neutral or to ground not involving the telephone wires would still impress voltage

Paragraph 5.1 revised to incorporate Addendum No. 3 - June 1958.

on the telephone wires by magnetic induction. The magnitudes of these longitudinally-induced voltages may first be compared for the 14.4 kv and the 7.2 kv cases on the assumption that the short-circuit currents are the same and similarly divided between neutral and ground. If the neutral is at the same vertical spacing from the telephone conductors at 14.4 and at 7.2 kv as will normally be the case, the induced voltage will be the same in either case.

6.2 If any fault location such that the fault current is smaller at 14.4 kv, the situation would thus favor the 14.4 kv system as against the 7.2 kv system. For faults at great distances from the substation (for which the induced voltage may still be relatively large in spite of the lowered magnitude of the fault current), the induced voltage will be higher at 14.4 kv. Local conditions will be the determining factor here. But, as a general statement, it is unlikely that abnormal magnetic induction would significantly influence the choice between joint use at 7.2 and at 14.4 kv.

7. **Noise**

7.1 There are many factors that affect noise in circuits on a joint use line. Some of these factors are dependent on voltage, others are dependent on current. Therefore, for the same system kva rating, an increase in noise from some sources would be expected with a 14.4 kv system as compared with an equivalent 7.2 kv system, while a decrease would be expected from other sources. The net effect of an increase in voltage would be entirely different in different situations. Therefore there is no reason to suppose that noise conditions would be materially worse in joint use at 14.4 than at 7.2 kv.

JOINT USE OF POLES

Purpose: The purpose of this addendum is to supplement REA TE & CM-690, "Joint Use of Poles" and Addendum 1 thereto with information required in the design of aerial cable plant in joint use construction.

Additions:

1. SCOPE

1.1 This addendum discusses joint use of poles for power circuits and aerial cable in rural areas. It is intended to be used in conjunction with the REA TE & CM-690 to which it is directly related.

2. GENERAL

2.4 In addition to construction economies the long spans commonly used for rural power circuits reduce cable maintenance costs because less bowing occurs than in short spans and less sheath trouble results as most of this trouble occurs near poles.

2.5 REA has established a maximum of 60 percent of the rated breaking strength of suspension strand as the limit to which the strand shall be stressed when the strand and cable it supports are loaded with ice and wind in accordance with the National Electrical Safety Code (NESC) storm loading assumptions. These loadings are stated in REA TE & CM-611, "Design of Pole Lines."

Table 1 gives the maximum allowable average spans for plastic sheath, plastic insulated cables of various weights per foot lashed to strand, in the NESC loading areas based on the 60 percent of rated breaking strength of the strand.

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TABLE 1

APPROXIMATE MAXIMUM AVERAGE SPANS FOR AERIAL
CABLE AND RELATED LOADED STRAND TENSION

ity Grade l Strand Size	Cable Weight Lbs/Ft.	Heavy Loading Max. Spans Feet	Heavy Loading Loaded Tension Lbs.	Medium Loading Max. Spans Feet.	Medium Loading Loaded Tension Lbs.	Light Loading Max. Spans Feet	Light Loading Loaded Tension Lbs.
6M	.25	325	3357	400	2945	400	2461
6M	.5	300	3546	400	3301	400	2854
6M	.75	250	3448	350	3389	400	3148
6M	1.0	250	3692	300	3385	400	3421
10M	.25	700	5953	900	5370	900	4529
10M	.5	600	6146	700	5427	700	4719
10M	.75	600	6551	700	5876	---	---
10M	1.0	600	6931	700	6306	700	5617

The use of 6M strand is not recommended for joint use in the light loading area where spans are in the order of 450 to 700 feet. This is because the effect of concentrated load at mid-span (splicer and tools), the relatively low strength of this size strand and the large sags required.

2.6 The final sag of cable will be greater than its initial stringing sag due to stretching of the strand due to wind and ice. The differences are ignored in urban or other short span construction but cannot be ignored in long spans because sags may vary as much as two or more feet between initial and final conditions even with cable weighing less than 1 lb. per foot. It is not practicable to restore cable to its original sag by pulling slack after an ice storm as is done with open wire. Consequently, it is necessary to allow initially for sag increase due to storms when determining the ground clearance and when making joint pole strand attachment points so the initial sag will give the NESC required separations from the power wires in the spans and at the poles.

2.7 The weights of plastic cable used by REA borrowers in aerial plant along rural roads where power line spans are relatively long will seldom exceed 1.0 lb. per foot. The data herein are limited to that required for cables not much in excess of 1.0 lb. per foot. There are many more different cable diameters and weights per foot than there are of commonly used telephone line wires. This makes it impracticable to furnish exact data for all of the cable sizes commonly used in long span construction. It is practicable to group cable sizes of approximately the same weight per foot for the purposes of this addendum, and thereby limit the number of data sheets and curves required. The data in this addendum are limited to copper conductor cables lashed to either 6M or 10M utility grade galvanized steel strand.

2.8 REA power line construction in rural areas uses sags and tensions based on "ruling spans." Expressed as a formula it is: Ruling Span = Average Span + 2/3 (Max. Span - Average Span). As a general rule, REA borrowers' rural power lines make use of one of four different power conductors. Final unloaded sag curves of these four kinds of conductors are given in Figures 8 to 16 inclusive. Final unloaded sag means the sag after the conductors have been loaded with wind and ice to the amounts specified by the NESC and the load is removed. It is necessary that the kind of power conductors and the ruling span used in the joint line be known in designing joint use for telephone cable and that the theoretical final unloaded sag of the power conductors be used when determining clearances between power and communication conductors. In aerial telephone cable construction the sag and tension data are not furnished on the basis of ruling spans but on actual span lengths on the assumption that the cable is deadended at both ends of the span; in other words it is assumed that the poles do not lean due to the loading.

2.9 Cable suspension strand is placed to definite tensions depending on strand size and temperature. The tension is practically uniform from deadend to deadend in the strand when placed, regardless of span length variations. After a cable has been placed and supported by a strand, the sags will vary in spans of different lengths.

2.10 In checking the sag that results in a cable span after a job is finished, some variation for each different span length from the sag curve amount can be expected. The amount of the variation cannot be exactly forecast. The sag in a short span probably will be less than shown on the sag curve for a certain average span and greater for a span longer than the average. The sag would agree with the sag curve calculated value only in the case of a level section of line having exactly equal span lengths throughout.

2.11 Cable dancing, also called galloping, may occur where high winds prevail. Where there is the possibility of this phenomenon occurring, the cables should be spiraled around the strand immediately after placing, in accordance with instructions provided in REA TE & CM-635, "Construction of Aerial Cable Plant." If this is not done there is the possibility of the cable dancing sufficiently to cause contact between it and the power conductor above it.

2.12 REA TE & CM-635 should be consulted for construction practices.

2.13 All applicable requirements of the NESC should be complied with.

3. STRENGTH REQUIREMENTS

3.4 Longer spans could be provided by using 16M strand than with 6M or 10M but this large strand is out of proportion in size to small

cables and costs considerably more than 10M strand (about 30-35%). It is necessary to use 10M strand for small cables in extra long span construction where 6M strand would be adequate for short spans. This is because of the considerable sag that results in very long spans even with small cables if supported by small size strand.

3.5 Strand and the cable it supports can be equated in terms of bare wire for pole strength determination when using Figures RD-1 to 15 of Issue 1, REA TE & CM-690, "Joint Use of Poles." The transverse load that will be added on power poles by cable lashed to strand is given in the following table of equivalents to .109 inch diameter wire.

Table 2

APPROXIMATE EQUIVALENT IN NUMBERS OF 0.109 INCH DIAMETER BARE WIRES FOR CABLE LASHED TO 6M OR 10M STRAND FOR USE IN COMPUTING TRANSVERSE LOADS ON POLES

	Numbers of Wires Storm Loading District		
Diameter, Cable Only	Heavy	Medium	Light
0.5 inch	2	2	8
0.75	2	4	12
1.0	2	4	14
1.25	4	4	16
1.5	4	4	18
1.75	4	6	20
2.0	4	6	22
2.25	4	6	24
2.5	4	6	28

Note: Diameters stated are for cable only; that is, strand diameter is not included. However, the data given in numbers of bare wires is based on the cable diameter plus the strand diameter. For example, a cable 0.5 inch in diameter lashed to a 6M or 10M strand when storm loaded equates approximately to 2 bare 0.109 inch diameter wires when these are storm loaded, in the heavy storm loading district.

4 CLEARANCE AND SEPARATION REQUIREMENTS

4.4 Where cable is attached to power poles that also support open wire telephone crossarms, the cable should be attached to the poles under the lowest crossarm to minimize the possibility of open wires swinging against the cable strand which is grounded. The final unloaded sag of cable and strand, especially in long span construction, generally is greater than the maintenance sag for open wires in the same spans.

This page was reissued to incorporate revised Table 2, formerly Addendum No. 4 to the Telephone Engineering and Construction Manual, Section 690.

4.5 Among the NESC requirements which should be observed are those relating to the location of vertical cable runs on poles, such as for underground feeds, dips and pole mounted cable terminals and loading coils.

4.6 Secondaries on power poles usually are below the neutral wire and generally are of such size that they are installed with the same sag as the neutral wire. The lowest secondary is assumed to be attached to poles 3 feet below the neutral wire. The data sheets provided herein are based on these assumptions.

4.7 REA TE & CM-690 in paragraphs 4.31 to 4.37 states in detail the requirements for vertical separations of circuits at the supports and in spans. Briefly stated these requirements are:

4.71 Minimum vertical separation at the supports between telephone

circuits and power conductors of less than 8700 volts betwe conductors is 40 inches. This includes separation from pow transformers.

4.72 Minimum vertical separation at the supports between telepho circuits and power conductors of more than 8700 volts betwe conductors is 60 inches.

4.73 Minimum vertical separation in spans between telephone circuits and power conductors of less than 8700 volts between conductors is 30 inches.

4.74 Minimum vertical separation in spans between telephone circuits and power conductors of more than 8700 volts between conductors is 45 inches.

4.75 Other requirements are that (1) telephone circuit attachmen on poles shall be adjusted so that at 60°F and no wind, no secondary (0-750 volts) shall hang below a straight line of sight between telephone circuit attachments on adjacent pol and (2) no power conductor of more than 750 volts shall be lower than 30 inches above this line of sight. This applie even though a neutral is below the power conductors. The neutral in this case is covered by paragraphs 4.71 and 4.73 above.

4.8 The minimum permissible ground clearance for power wires along ro in rural areas under NESC rules usually is 18 feet basic, but thi may be reduced to 15 feet basic where the ground under the line r will be traveled except by pedestrians.

Communication conductors (including cables) require 14 foot basi ground clearance in the same rural areas but may be 13 feet basi if not overhanging traveled portions of the road or 8 feet basic where the ground under the line will never be traveled except by pedestrians. Data herein covers basic ground clearances of 8, 1(12 and 14 feet for telephone cable and assumes 15 foot minimum p(wire ground clearance.

4.9 REA TE & CM-635 includes strand stringing tension and sag data a 20°, 60° and 100°F for 6M, 10M and 16M strands. Figure 1 herewi gives strand stringing sags at 60° for 6M and 10M strand.

4.10 Initial sag curves at 60°F and final sag curves at 120°F for cab weighing .25 to 1.0 pounds per foot with 6M and 10M strands are given in Figures 2 to 7, inclusive, for the heavy, medium and li loading areas. The 120°F sag curves are given because this give the greatest sags that are likely to occur in hot weather.

CLIMBING SPACE REQUIREMENTS

5.3 Where two or more cables are attached to a power pole they shall be on the same side of the pole to comply with NESC climbing space requirements.

5.4 Cables preferably shall be attached to the same side of the pole as the power neutral wire.

ELECTRICAL PROTECTION REQUIREMENTS

6.3 The requirements of REA TE & CM-81[illegible], "Cable Circuit Protection" should be complied with. In brief, these requirements are that cable sheaths or shields be bonded to the MGN of the power system via the support strand and a vertical pole ground wire (1) at the beginning and end of the joint use section; (2) at one mile intervals (if the section is more than 1.5 miles in length); and (3) on every electric supply pole that carries a vertical pole ground wire to which is connected transformers, capacitors, or other types of power equipment that draw load current under normal conditions. In addition to the above grounding bonds the cable sheath or shield should be electrically connected to the central office ground.

INDUCTIVE COORDINATION

7.4 REA TE & CM-450, "Inductive Coordination - Telephone Circuit Noise Due to Induction from Electric Power Lines," should be consulted particularly as to the relative merits of cable on joint poles with power circuits versus cable on a pole line at highway separation from the power line.

ECONOMIC CONSIDERATIONS

8.5 Where more than two poles per mile require replacement or pole inserts to permit joint use for cable, the project is doubtful economically. Cost studies should be made in any event as outlined in REA TE & CM-205, "Preparation of an Area Coverage Design," and REA TE & CM-218, "Plant Annual Cost Data for System Design."

SAFETY CONSIDERATIONS

9.6 Telephone linemen should not work in power space above communication space on joint use poles. Vertical pole ground wires on electric supply poles that are interconnected to transformers or capacitor banks should be connected directly to the power system neutral. The transformer or capacitor banks should also have direct connections to the power system neutral. At such locations visual inspection from the ground should be made before climbing, to ascertain that the vertical pole ground wire is <u>actually</u> connected to the neutral. If it is not connected, this fact should be reported to

the power company and the wire should be regarded as energized. The pole should not be touched or climbed by telephone linemen until the condition has been corrected by the power company.

9.7 When suspension strand is installed it has much less sag than after cable is placed on it. Power wires have considerable sag in long span rural construction. Consequently, it may be necessary to attach the suspension strand temporarily at a point below its final attachment point to prevent contact with power wires above it on the same poles until cable is placed on the strand. The temporary location should keep the strand at mid-span below the lowest power wire attached to the poles above the strand. The temporary means of attachment can be by driving lag bolts into the poles or by placing other suitable support hardware at proper height to give the temporary clearance. Washers can be placed on the bolts and the strand can be placed on the bolts between the washers and poles. The strand then can be secured to the poles with .109 inch steel line wire to hold it temporarily until after the cable is supported by the strand. The strand and cable then can be raised to the throughbolts and the strand attached by three bolt cable clamps in the standard manner.

9.8 The curves of sags for strand only and for strand with cable in place can be used to determine the temporary location of the strand on the poles. For example, a 6M strand when installed will have about 2.5 feet of sag in a 300 foot span at 60°F. A cable weighing .5 pounds per foot on this strand will increase the sag to nearly 5 feet. Therefore in this case the strand should be placed 2.5 feet below its final location, assuming that this point is to bring the cable at mid-span to a point 30 inches below the lowest pole attached power wire.

9.9 Safety considerations dictate that cables be lashed in joint use construction from the ground rather than by a man riding the strand to handle the lashing machine.

9.10 Strand should be grounded at all times during installation and permanently bonded to the neutral power wire immediately after stringing.

9.11 In long spans intermediate poles between power poles to support the cable but not the power wires create an electrical hazard and should be avoided.

9.12 Telephone linemen may make bonding connections to vertical pole ground wires in communication space on joint use poles. If no vertical pole ground wire exists on a pole on which a grounding bond is required, sufficient bonding wire to reach and connect the MGN shall be left coiled and taped two feet above the cable. Attachment of this wire in electric supply space on the pole and

CLIMBING SPACE REQUIREMENTS

5.3 Where two or more cables are attached to a power pole they shall be on the same side of the pole to comply with NESC climbing space requirements.

5.4 Cables preferably shall be attached to the same side of the pole as the power neutral wire.

ELECTRICAL PROTECTION REQUIREMENTS

6.3 The requirements of REA TE & CM-8__, "Cable Circuit Protection" should be complied with. In brief, these requirements are that cable sheaths or shields be bonded to the MGN of the power system via the support strand and a vertical pole ground wire (1) at the beginning and end of the joint use section; (2) at one mile intervals (if the section is more than 1.5 miles in length); and (3) on every electric supply pole that carries a vertical pole ground wire to which is connected transformers, capacitors, or other types of power equipment that draw load current under normal conditions. In addition to the above grounding bonds the cable sheath or shield should be electrically connected to the central office ground.

INDUCTIVE COORDINATION

7.4 REA TE & CM-450, "Inductive Coordination - Telephone Circuit Noise Due to Induction from Electric Power Lines," should be consulted particularly as to the relative merits of cable on joint poles with power circuits versus cable on a pole line at highway separation from the power line.

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SAFETY CONSIDERATIONS

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9.7 When suspension strand is installed it has much less sag than after cable is placed on it. Power wires have considerable sag in long span rural construction. Consequently, it may be necessary to attach the suspension strand temporarily at a point below its final attachment point to prevent contact with power wires above it on the same poles until cable is placed on the strand. The temporary location should keep the strand at mid-span below the lowest power wire attached to the poles above the strand. The temporary means of attachment can be by driving lag bolts into the poles or by placing other suitable support hardware at proper height to give the temporary clearance. Washers can be placed on the bolts and the strand can be placed on the bolts between the washers and poles. The strand then can be secured to the poles with .109 inch steel line wire to hold it temporarily until after the cable is supported by the strand. The strand and cable then can be raised to the throughbolts and the strand attached by three bolt cable clamps in the standard manner.

9.8 The curves of sags for strand only and for strand with cable in place can be used to determine the temporary location of the strand on the poles. For example, a 6M strand when installed will have about 2.5 feet of sag in a 300 foot span at 60°F. A cable weighing .5 pounds per foot on this strand will increase the sag to nearly 5 feet. Therefore in this case the strand should be placed 2.5 feet below its final location, assuming that this point is to bring the cable at mid-span to a point 30 inches below the lowest pole attached power wire.

9.9 Safety considerations dictate that cables be lashed in joint use construction from the ground rather than by a man riding the strand to handle the lashing machine.

9.10 Strand should be grounded at all times during installation and permanently bonded to the neutral power wire immediately after stringing.

9.11 In long spans intermediate poles between power poles to support the cable but not the power wires create an electrical hazard and should be avoided.

9.12 Telephone linemen may make bonding connections to vertical pole ground wires in communication space on joint use poles. If no vertical pole ground wire exists on a pole on which a grounding bond is required, sufficient bonding wire to reach and connect the MGN shall be left coiled and taped two feet above the cable. Attachment of this wire in electric supply space on the pole and

and connection to the NEM must be done by power company linemen.

10. DETERMINATION OF POLE REPLACEMENTS REQUIRED IN EXISTING POWER POLE LINES

10.52 Reference should be made to the REA TE & CM-690 paragraphs under this heading. In this addendum the vertical separation data are given in RD Figures 64 to 98 inclusive for cable placing.

10.53 The following examples are provided for use in determining the practicability of joint use for cable:

Example No. 4:

Conditions:

Cable Size	25 pr., 22 ga. plastic sheath and insulation.
Loading District	Heavy
Cable Ground Clearance	8 feet
Average Span Length	300 feet
Ground	Level
Power Pole Height	30 feet
Pole Class	Class 6
Secondaries	None
Power Wires	4-7/1 ACSR
Power Wire Configuration	Single Phase, 2 Wire
Voltage	7200 volts
Proposed Suspension Strand	6M
Ruling Span Length	325 feet

Solution:

Step 1. Cable Weight = .209 lb. per foot. Consider it to be .25 lb. per foot.

Step 2. Table 1 shows that this 25 pr. 22 ga. cable can be used on 6M strand for average spans up to 325 feet in heavy loading.

Step 3. Power neutral wire point of attachment above ground on 30 ft. pole is 21 feet.

Step 4. Power wire final sag in a 300 ft. span where ruling span is 326 feet is 3.5 feet (Figure 8).

Step 5. Initial sag of .25 lb. per foot cable on 6M strand, 300 ft. span, heavy loading, is 3.5 feet (Figure 2).

Step 6. Final sag of .25 lb. per foot cable on 6M strand, 300 ft. span, heavy loading is 6.0 feet (Figure 2).

Step 7. Because the initial sag of the cable will be equal to the final sag of the power wire (3.5 ft.) the cable can be attached 3.5 feet below the power wire point of attachment. This point is 21 minus 3.5 which is 17.5 feet above ground.

Step 8. With the cable attached 17.5 ft. above ground and final cable sag of 6.0 ft., the ground clearance at mid-span on level ground would be 11.5 feet.

Step 9. The attachment of the cable can be 3.5 feet below the point of power neutral attachment per Step 6 above. The cable equates to approximately 4 open wires per paragraph 3.5. The 4-7/1 ACSR power wire diameter is .257 inches (approximately .250 in.). Reference to REA TE & CM-690, RD Figure No. 2 for "2 power conductors" and "4 communication conductors" can be carried safely in 300 ft. spans by a Class 6 pole in heavy loading.

Example No. 5:

Conditions:

Cable Size	75 pr., 22 ga. plastic sheath and plastic insulation.
Loading Area	Medium
Cable Ground Clearance	8 feet
Average Span Length	350 feet
Ground	Level
Power Pole Height	35 foot
Pole Class	Class 7

Secondaries	None
Power Conductors	4-7/1 ACSR
Power Configuration	Single Phase, 2-wire
Voltage	7200 volts
Proposed Strand	6M
Ruling Span Length	425 feet

Solution

Step 1. Cable Weight = .504 lb. per foot. Consider it to be .5 lb. per foot.

Step 2. Table 1 shows that 75 pr., 22 gauge (.5 lb) cable on 6M strand can be used for average spans up to 400 feet in medium loading.

Step 3. Power neutral wire point of attachment above ground on 35 ft. pole is 25.5 feet.

Step 4. Power wire final sag at 350 feet where ruling span is 425 feet is 3.0 feet (Figure 12).

Step 5. Initial sag of .5 lb. per ft. cable on 6M strand, 350 ft. span, medium loading is 6.0 feet (Figure 3).

Step 6. Final sag of .5 lb. per ft. cable on 6M strand, 350 ft. span, medium loading is 7.75 feet (Figure 3).

Step 7. The cable must be attached to the pole at least 3.5 feet below the neutral wire. Because the initial cable sag (6 feet) is greater than the final sag of the neutral wire (3 feet) the cable will not violate the 2.5 foot required separation at mid-span. The cable attachment point will be 25.5 less 3.5 which is 22 feet above ground.

Step 8. The cable final sag of 7.75 feet means its final ground clearance will be 22 minus 7.75 which is 14.25 feet at mid-span. This fulfills the 8 ft. desired ground clearance requirement.

Step 9. The point of attachment of the cable will be at 22 ft. above ground which is 3.5 feet below the neutral wire attachment point (call it 4 feet). The cable equates to 6 open wires

per paragraph 3.5 in the medium loading area. The 4-7/1 ACSR power wire diameter is .257 in. (approximately .250 in.). Reference to Section 690, RD Figure No. 7 for "2 power conductors" and "6 telephone conductors" shows that a class 7 pole will safely carry the combined load in 350 ft. spans in the medium loading area.

11. STAKING OF JOINT USE LINE

11.6 Reference should be made to the REA TE & CM-690 paragraphs under this heading. In this addendum the staking tables are given in RD Figures 99 to 118 inclusive.

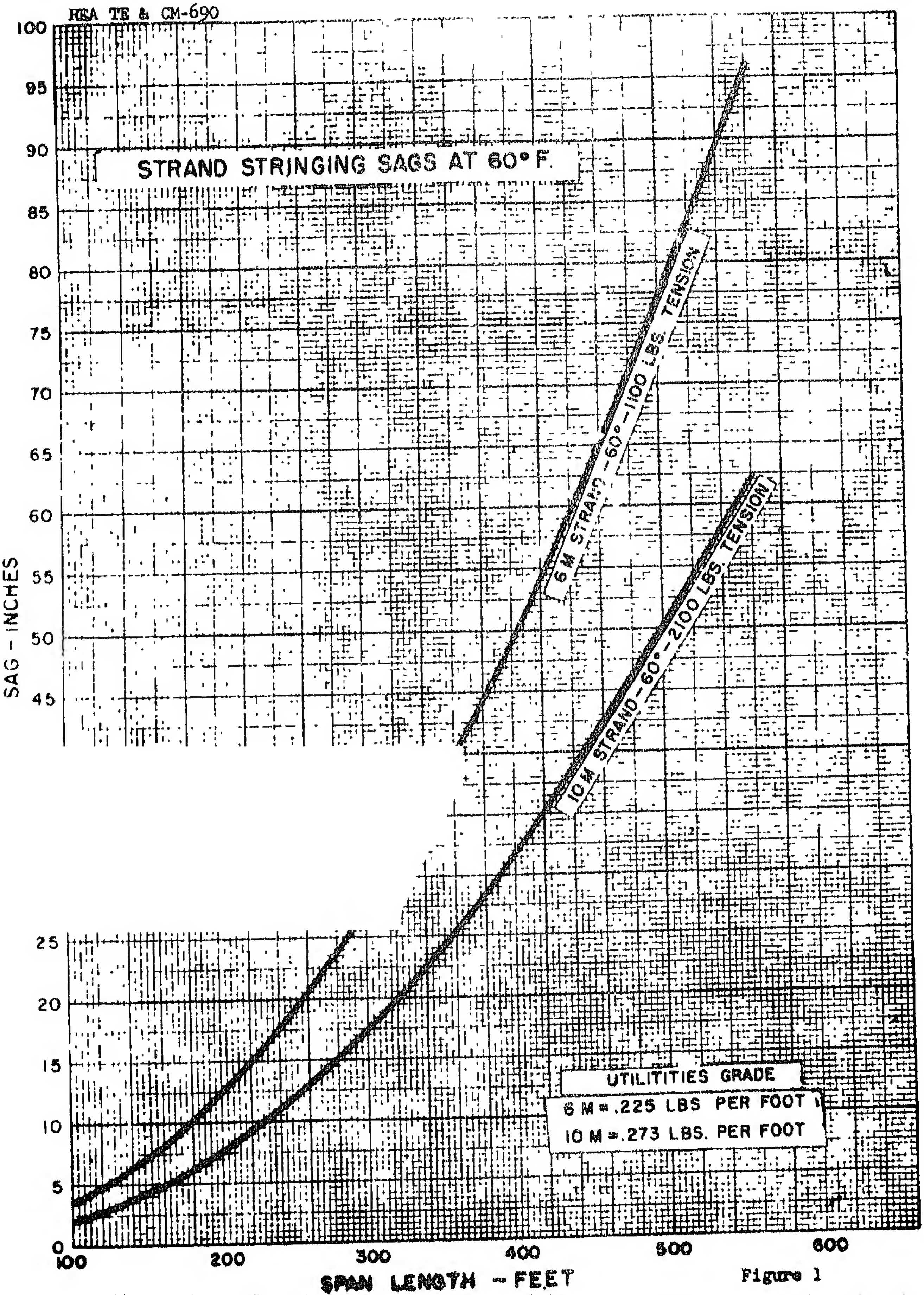

STRAND STRINGING SAGS AT 60° F.
6 M STRAND - 60° - 1100 LBS. TENSION
10 M STRAND - 60° - 2100 LBS. TENSION
UTILITIES GRADE
6 M = .225 LBS PER FOOT
10 M = .273 LBS. PER FOOT
SAG - INCHES
SPAN LENGTH - FEET
0
5
10
15
20
25
45
50
55
60
65
70
75
80
85
90
95
100
100
200
300
400
500
600

Figure 1

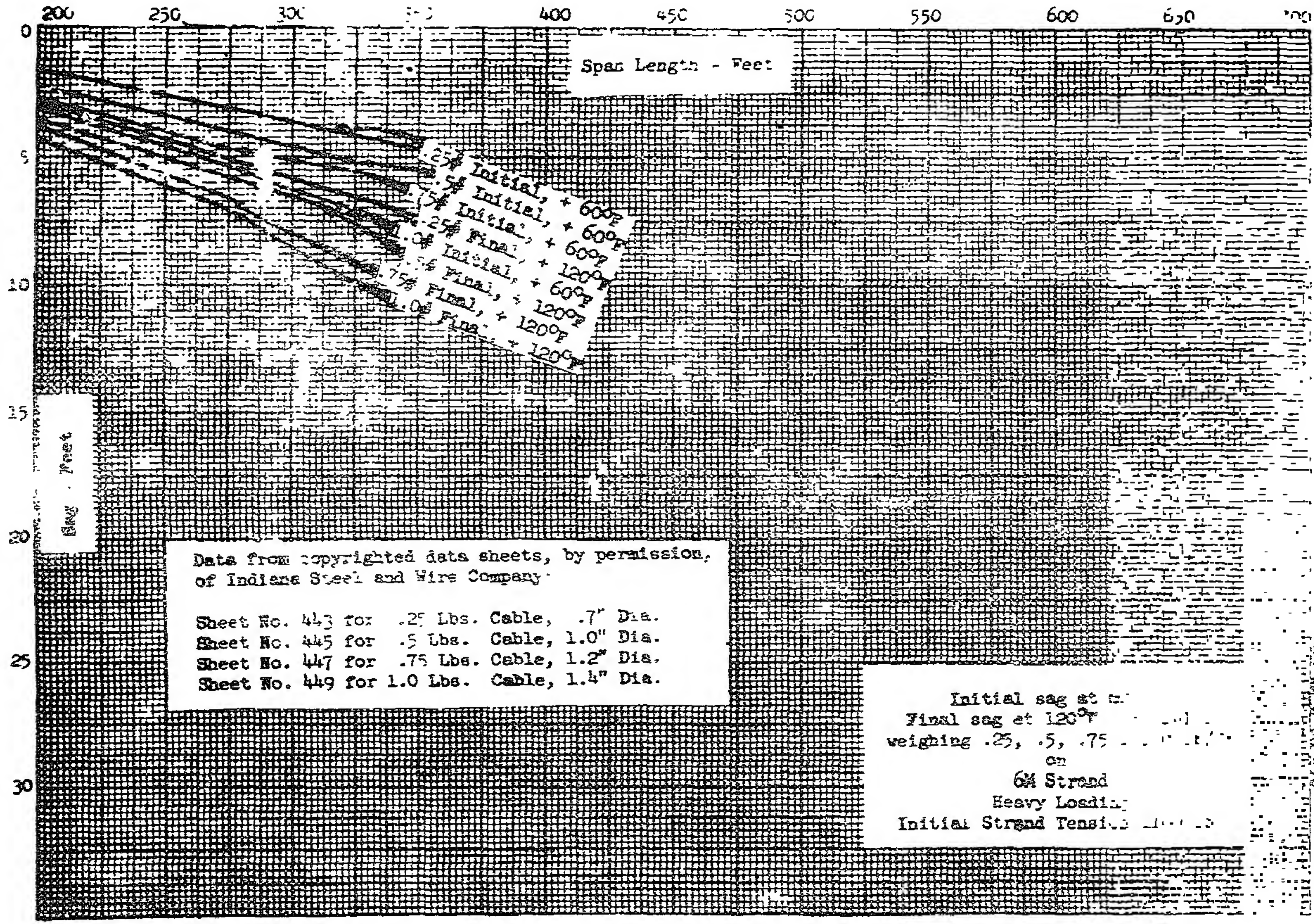

Span Length - Feet
Sag - Feet
200
250
300
400
450
500
550
600
0
5
10
15
20
25
30
.25# Initial, + 60°F
.5# Initial, + 60°F
.75# Initial, + 60°F
.25# Final, + 120°F
1.0# Initial, + 60°F
.75# Final, + 120°F
1.0# Final, + 120°F
Data from copyrighted data sheets, by permission, of Indiana Steel and Wire Company
Sheet No. 443 for .25 Lbs. Cable, .7" Dia.
Sheet No. 445 for .5 Lbs. Cable, 1.0" Dia.
Sheet No. 447 for .75 Lbs. Cable, 1.2" Dia.
Sheet No. 449 for 1.0 Lbs. Cable, 1.4" Dia.
Initial sag at
Final sag at 120°F
weighing .25, .5, .75
on
6M Strand
Heavy Loading
Initial Strand Tension

Figure 2

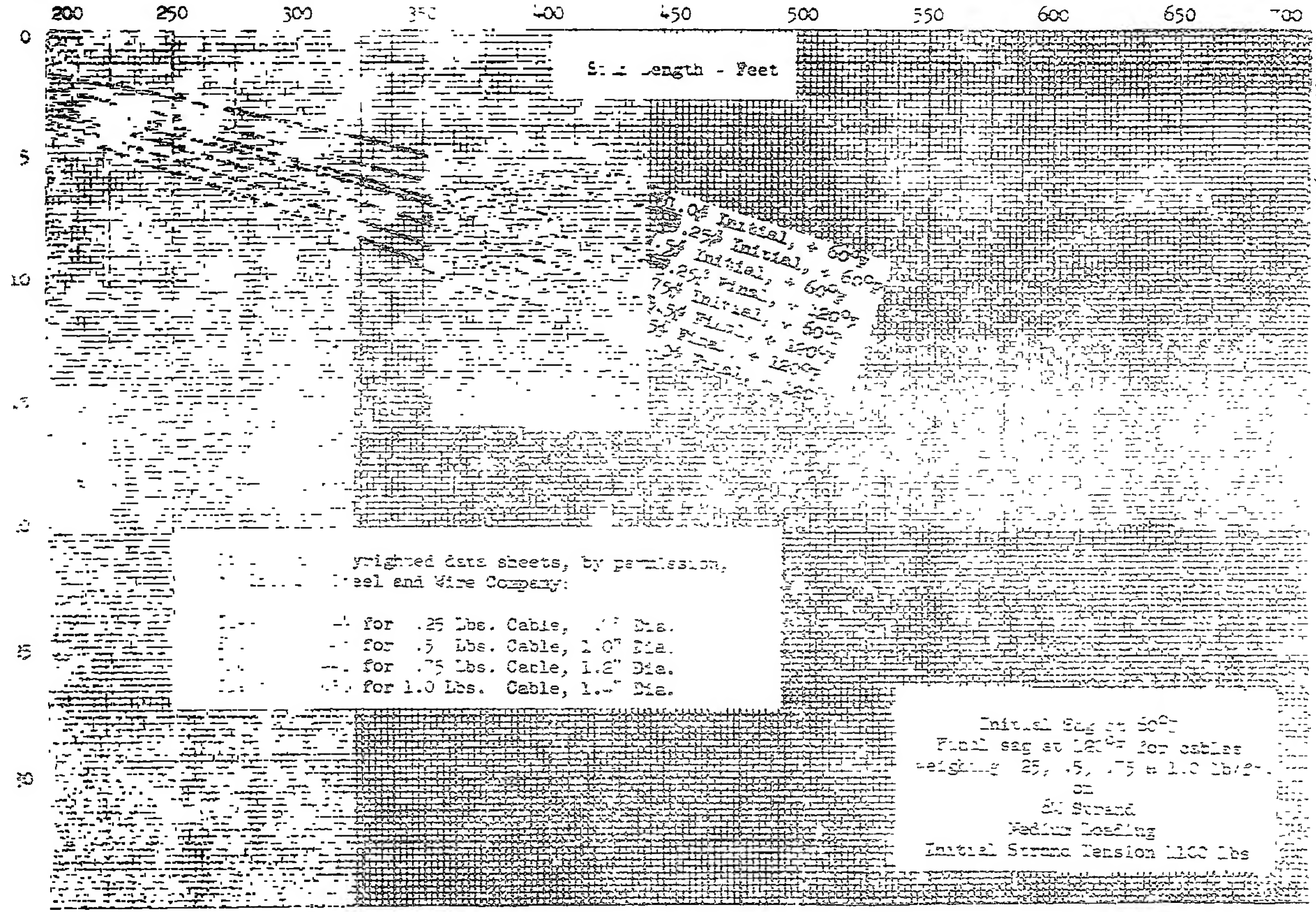
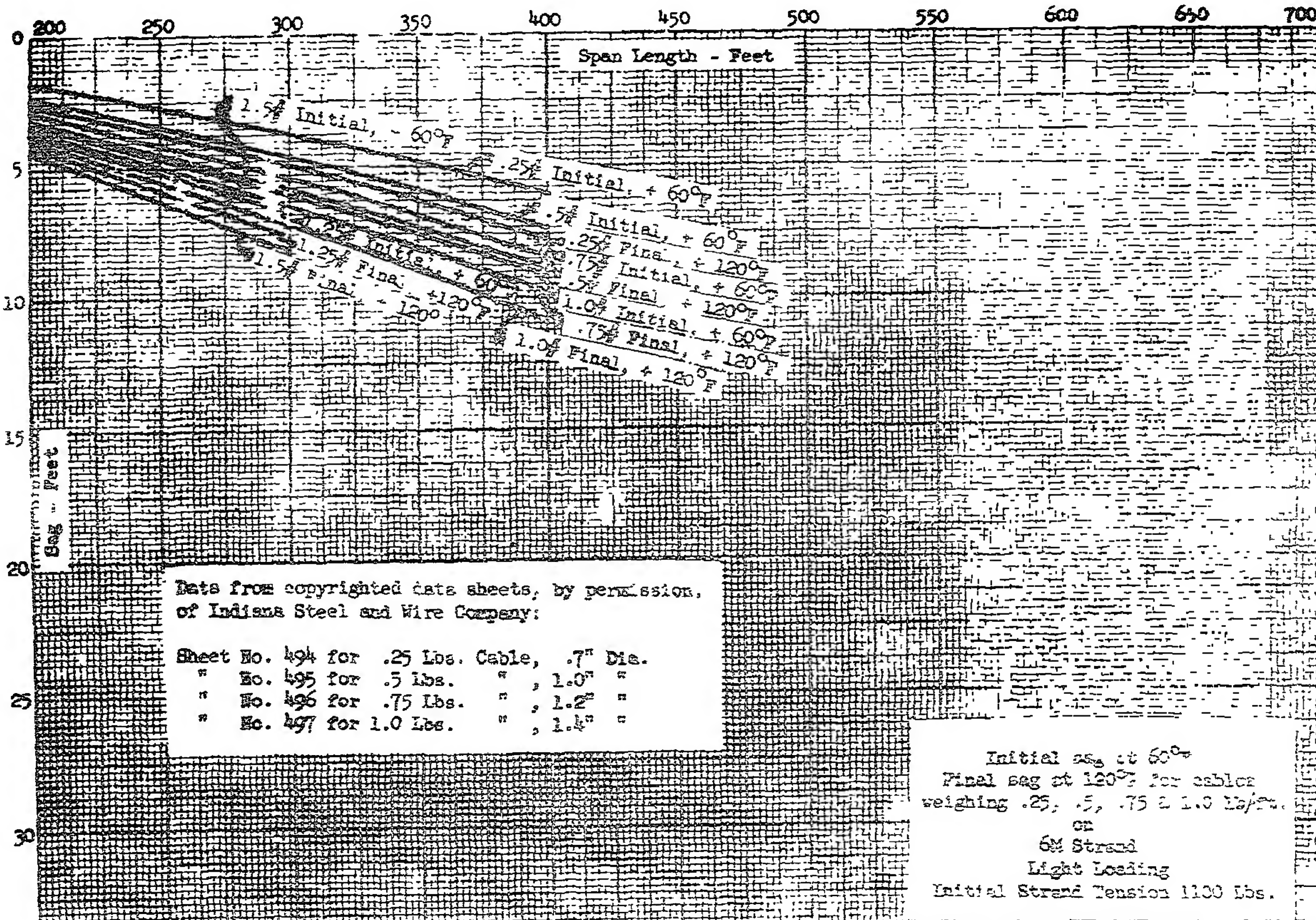

Span Length - Feet
200
250
300
350
400
450
500
550
600
650
700
0
5
10
15
20
25
30
1.0# Initial, + 60°F
.25# Initial, + 60°F
.5# Initial, + 60°F
.25# Final, + 120°F
.75# Initial, + 60°F
.5# Final, + 120°F
.75# Final, + 120°F
yrighted data sheets, by permission,
teel and Wire Company:
for .25 Lbs. Cable,
for .5 Lbs. Cable,
for .75 Lbs. Cable, 1.2" Dia.
for 1.0 Lbs. Cable, Dia.
Initial Sag at 60°F
Final sag at 120°F for cables
weighing .25, .5, .75 & 1.0 lb/ft.
on
Strand
Medium Loading
Initial Strand Tension Lbs

Figure 3



Span Length - Feet
200
250
300
350
400
450
500
550
600
650
700
Sag - Feet
0
5
10
15
20
25
30
1.5# Initial, - 60°F
.25# Initial, + 60°F
.5# Initial, + 60°F
.25# Final, + 120°F
.75# Initial, + 60°F
.5# Final, + 120°F
1.0# Initial, + 60°F
.75# Final, + 120°F
1.0# Final, + 120°F
1.25# Initial, + 60°F
1.25# Final, + 120°F
1.5# Final, - 120°F
Data from copyrighted data sheets, by permission, of Indiana Steel and Wire Company:
Sheet No. 494 for .25 Lbs. Cable, .7" Dia.
" No. 495 for .5 Lbs. " , 1.0" "
" No. 496 for .75 Lbs. " , 1.2" "
" No. 497 for 1.0 Lbs. " , 1.4" "
Initial sag at 60°F
Final sag at 120°F for cables weighing .25, .5, .75 & 1.0 Lb/ft.
or
6M Strand
Light Loading
Initial Strand Tension 1100 Lbs.

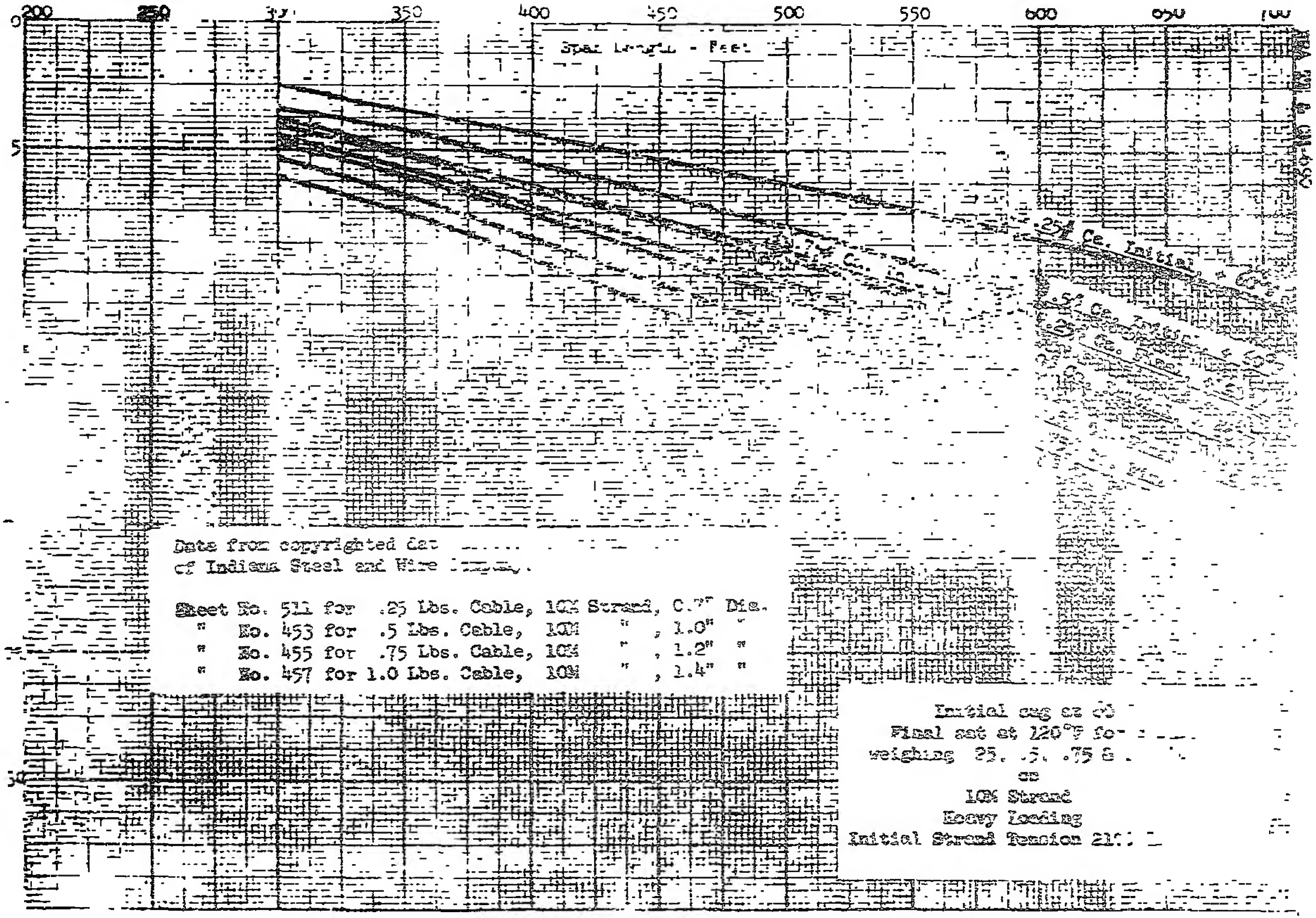
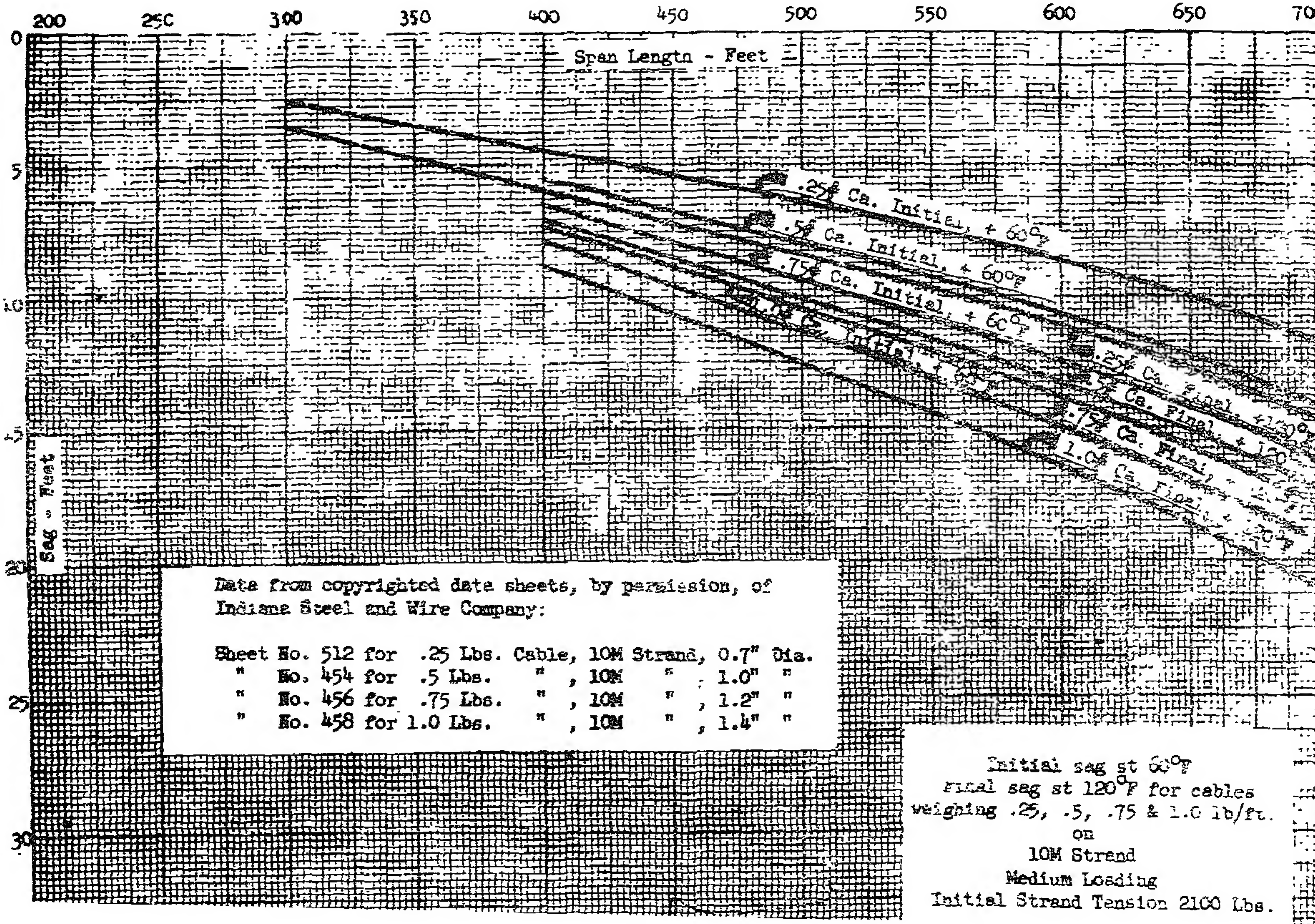
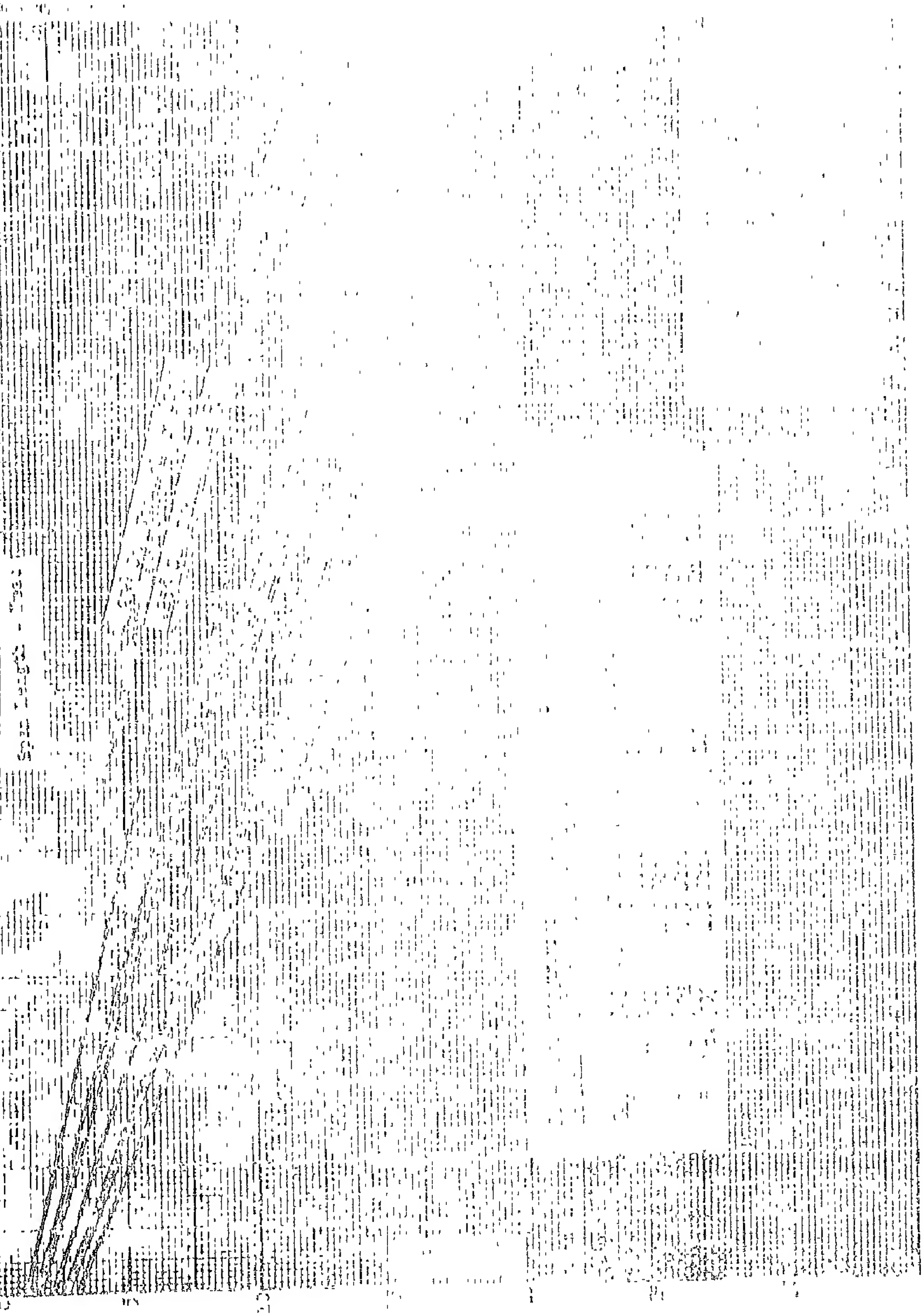
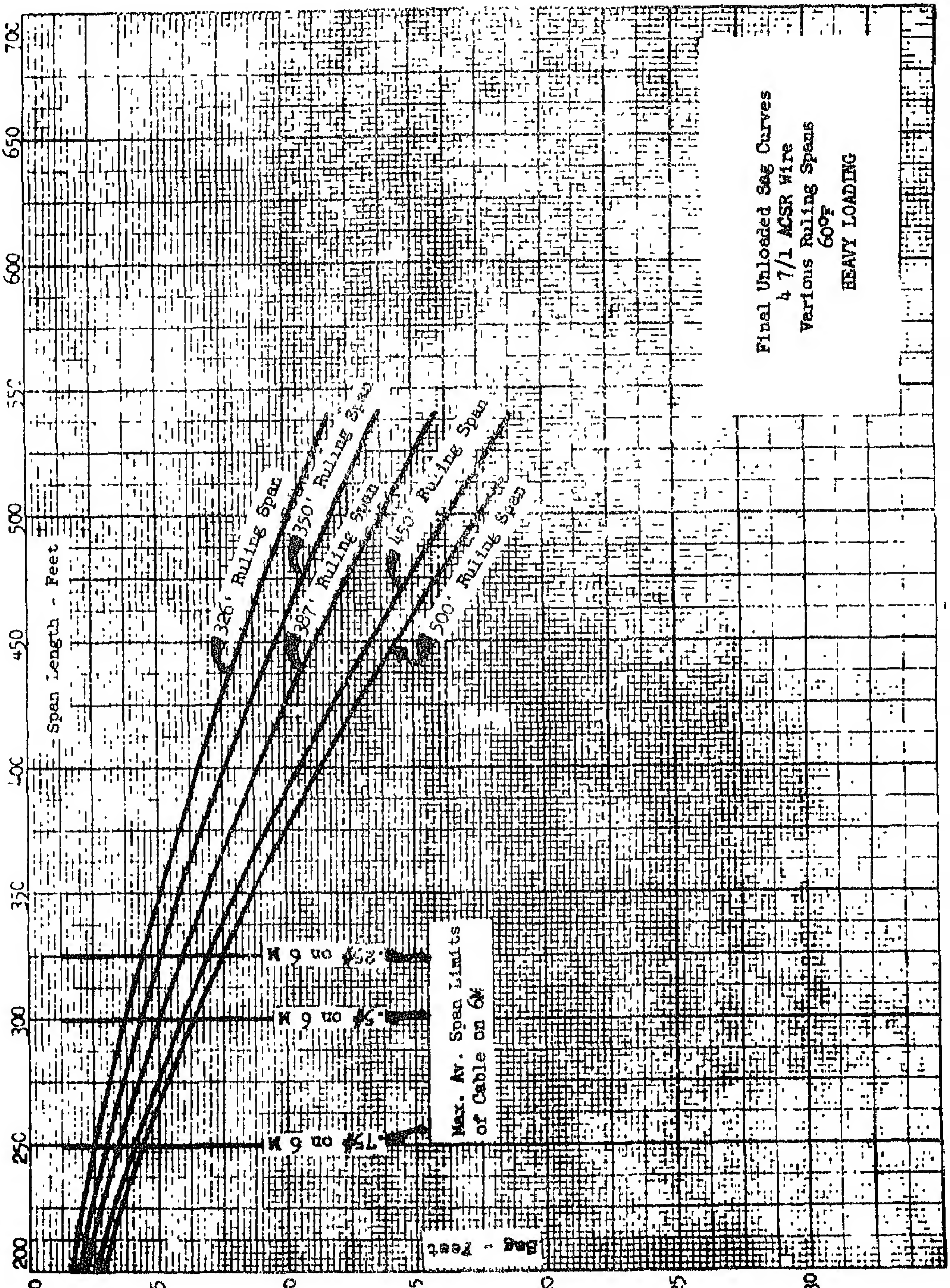

Span Length - Feet
200
250
300
350
400
450
500
550
600
650
700
0
5
.25# Ce. Initial
Date from copyrighted dat
of Indiana Steel and Wire
Sheet No. 511 for .25 Lbs. Cable, 10M Strand, 0.7" Dia.
" No. 453 for .5 Lbs. Cable, 10M " , 1.0" "
" No. 455 for .75 Lbs. Cable, 10M " , 1.2" "
" No. 457 for 1.0 Lbs. Cable, 10M " , 1.4" "
Initial sag at 60
Final sag at 120°F fo
weighing .25, .5, .75 &
on
10M Strand
Heavy Loading
Initial Strand Tension 21

Figure 5


Span Length - Feet
200
250
300
350
400
450
500
550
600
650
700
Sag - Feet
0
5
10
15
20
25
30
.25# Ca. Initial, + 60°F
.5# Ca. Initial, + 60°F
.75# Ca. Initial, + 60°F
.25# Ca. Final, +120°F
.5# Ca. Final, + 120°F
.75# Ca. Final
1.0# Ca. Final
Data from copyrighted data sheets, by permission, of Indiana Steel and Wire Company:
Sheet No. 512 for .25 Lbs. Cable, 10M Strand, 0.7" Dia.
" No. 454 for .5 Lbs. " , 10M " , 1.0" "
" No. 456 for .75 Lbs. " , 10M " , 1.2" "
" No. 458 for 1.0 Lbs. " , 10M " , 1.4" "
Initial sag at 60°F
Final sag at 120°F for cables
weighing .25, .5, .75 & 1.0 lb/ft.
on
10M Strand
Medium Loading
Initial Strand Tension 2100 Lbs.




Final Unloaded Sag Curves
4 7/1 ACSR Wire
Various Ruling Spans
60°F
HEAVY LOADING
Span Length - Feet
Sag - Feet
325' Ruling Span
350' Ruling Span
387' Ruling Span
450' Ruling Span
500' Ruling Span
Max. Av. Span Limits
of Cable on 6M
7% on 6 M

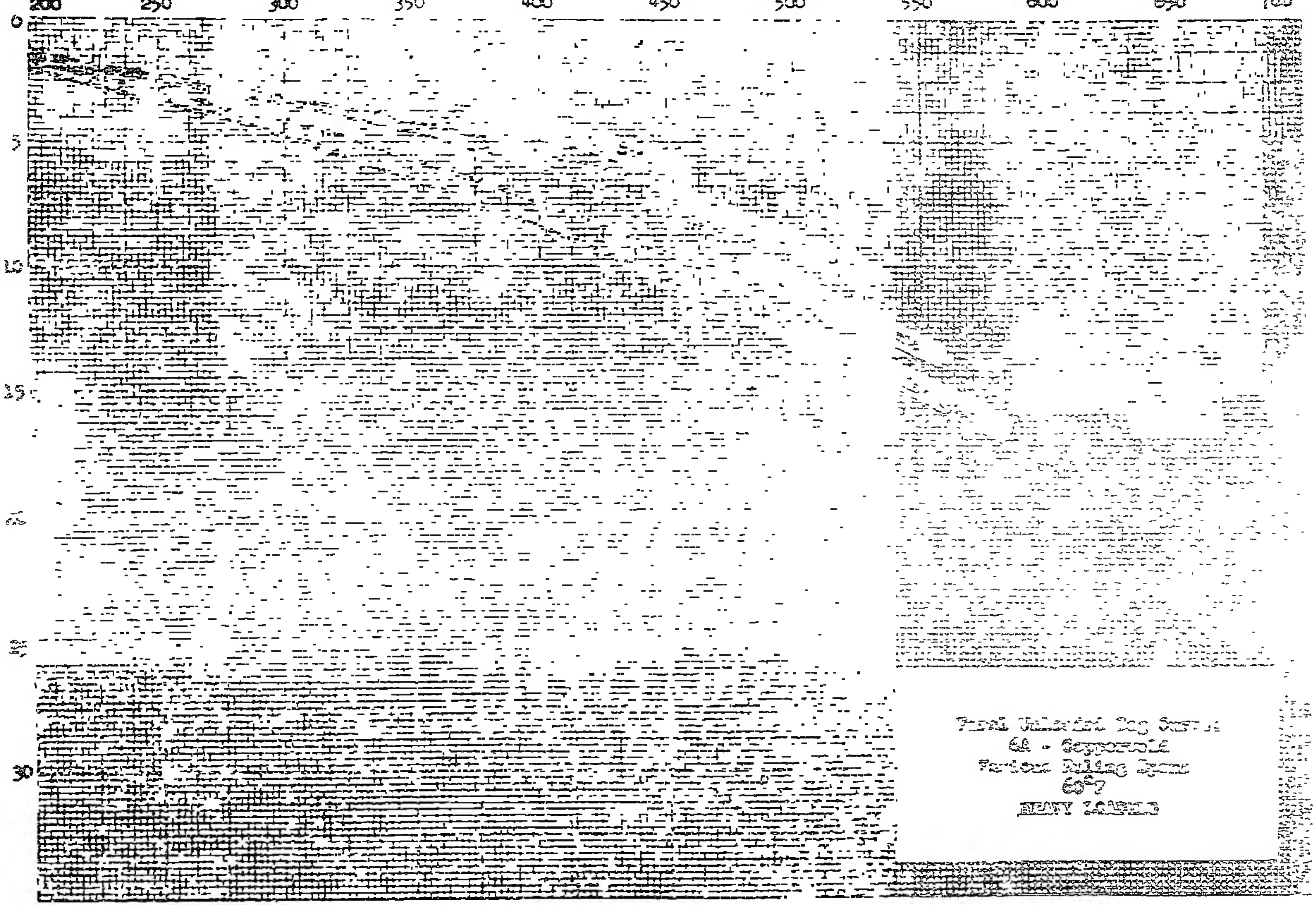
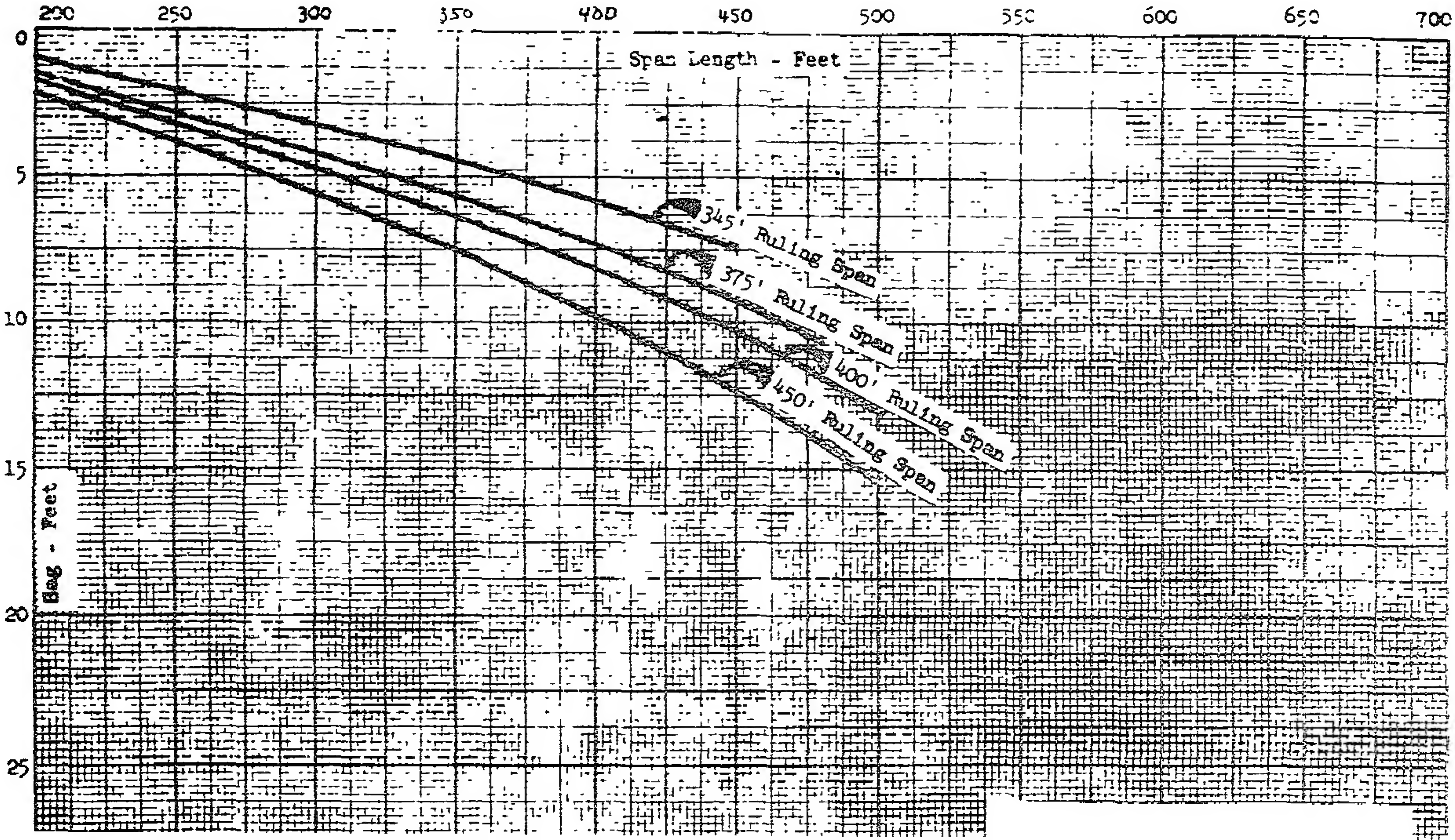


Figure 9



Span Length - Feet
Sag - Feet
200
250
300
350
400
450
500
550
600
650
700
0
5
10
15
20
25
345' Ruling Span
375' Ruling Span
400' Ruling Span
450' Ruling Span

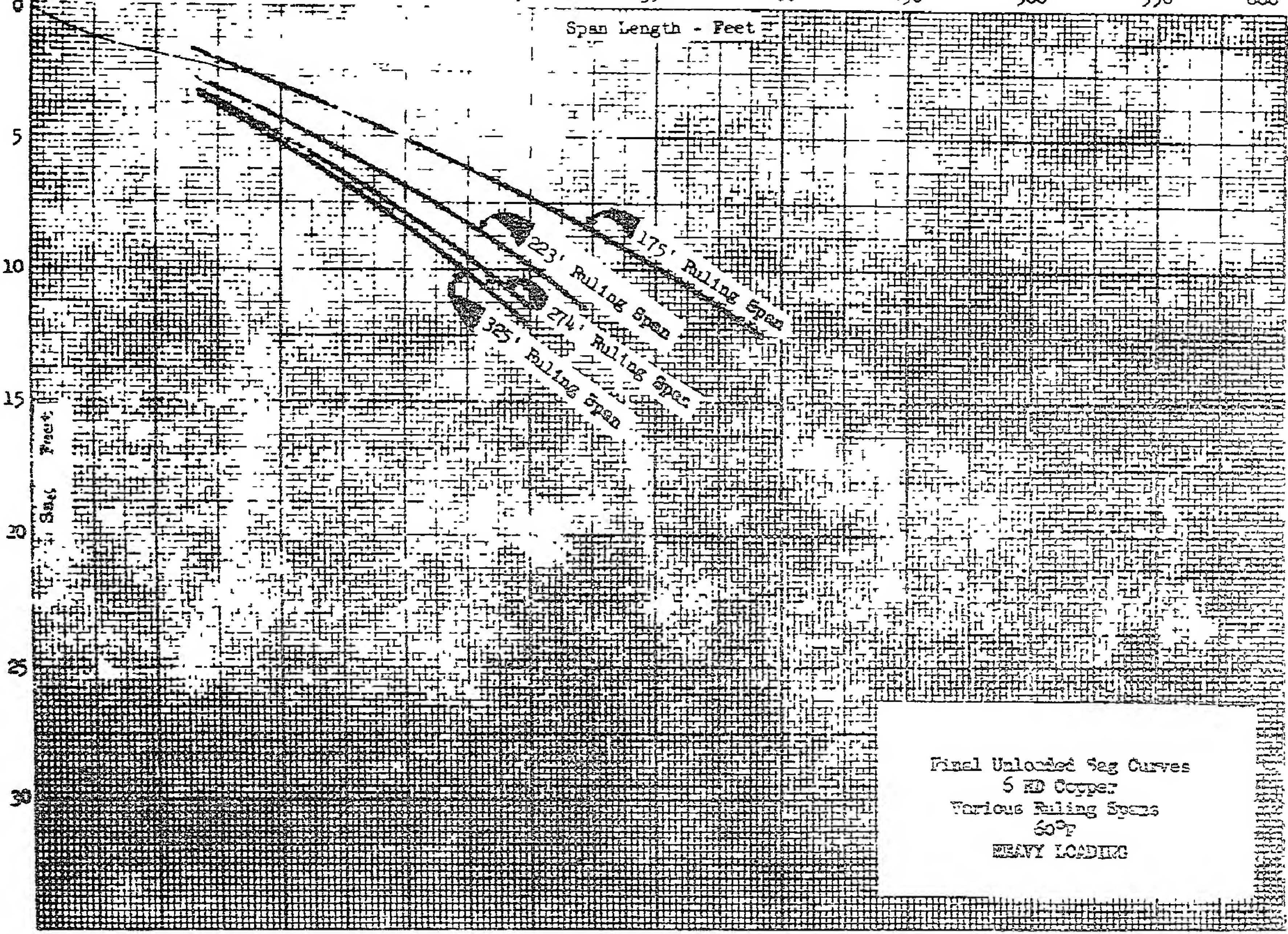
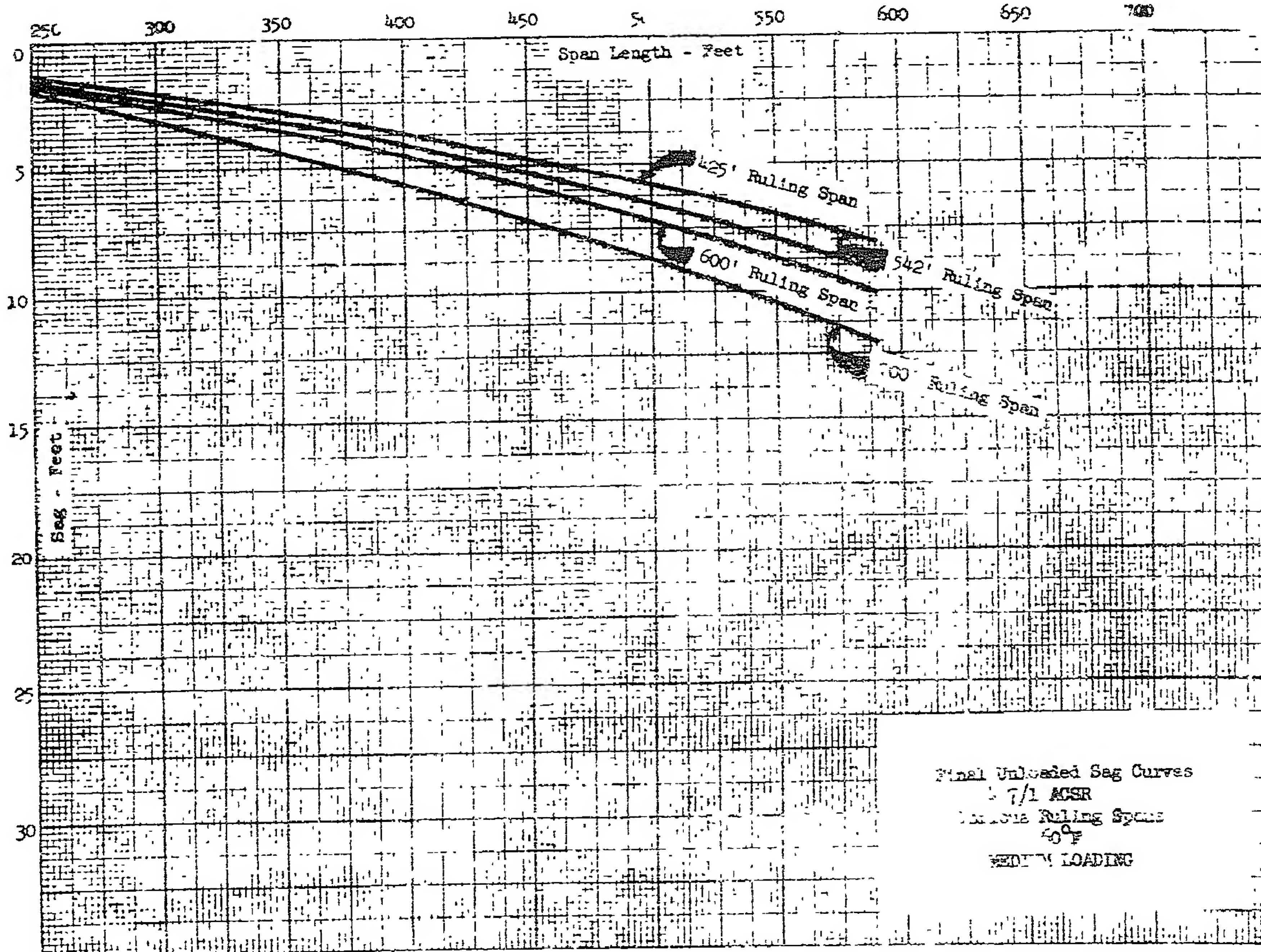
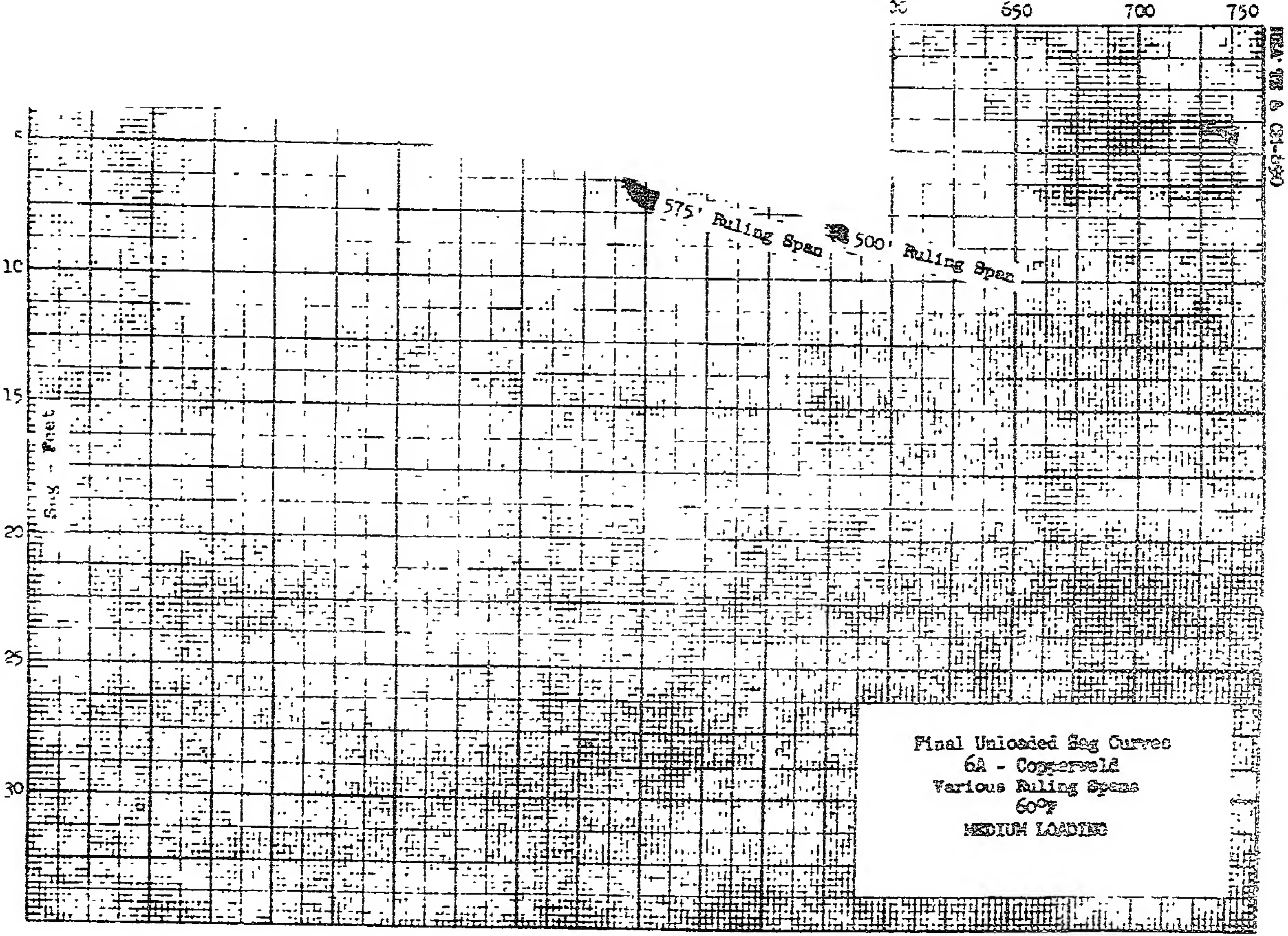

Span Length - Feet
175' Ruling Span
223' Ruling Span
274' Ruling Span
325' Ruling Span
Sag Feet
0
5
10
15
20
25
30
Final Unloaded Sag Curves
5 HD Copper
Various Ruling Spans
60°F
HEAVY LOADING

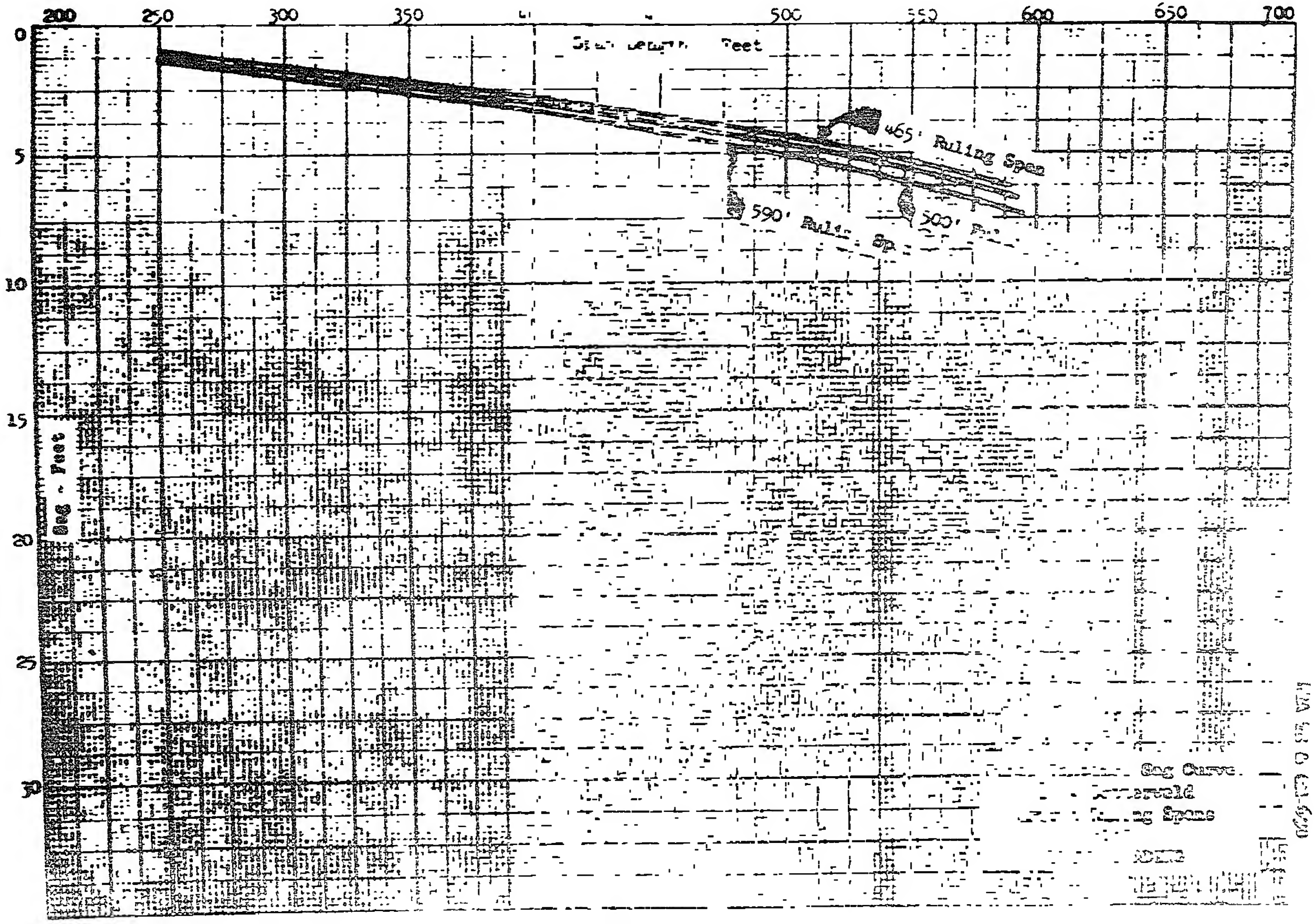
Figure 11


Span Length - Feet
250
300
350
400
450
550
600
650
700
Sag - Feet
0
5
10
15
20
25
30
425' Ruling Span
542' Ruling Span
600' Ruling Span
Ruling Span
Final Unloaded Sag Curves
7/1 ACSR
Ruling Spans
60°F
LOADING

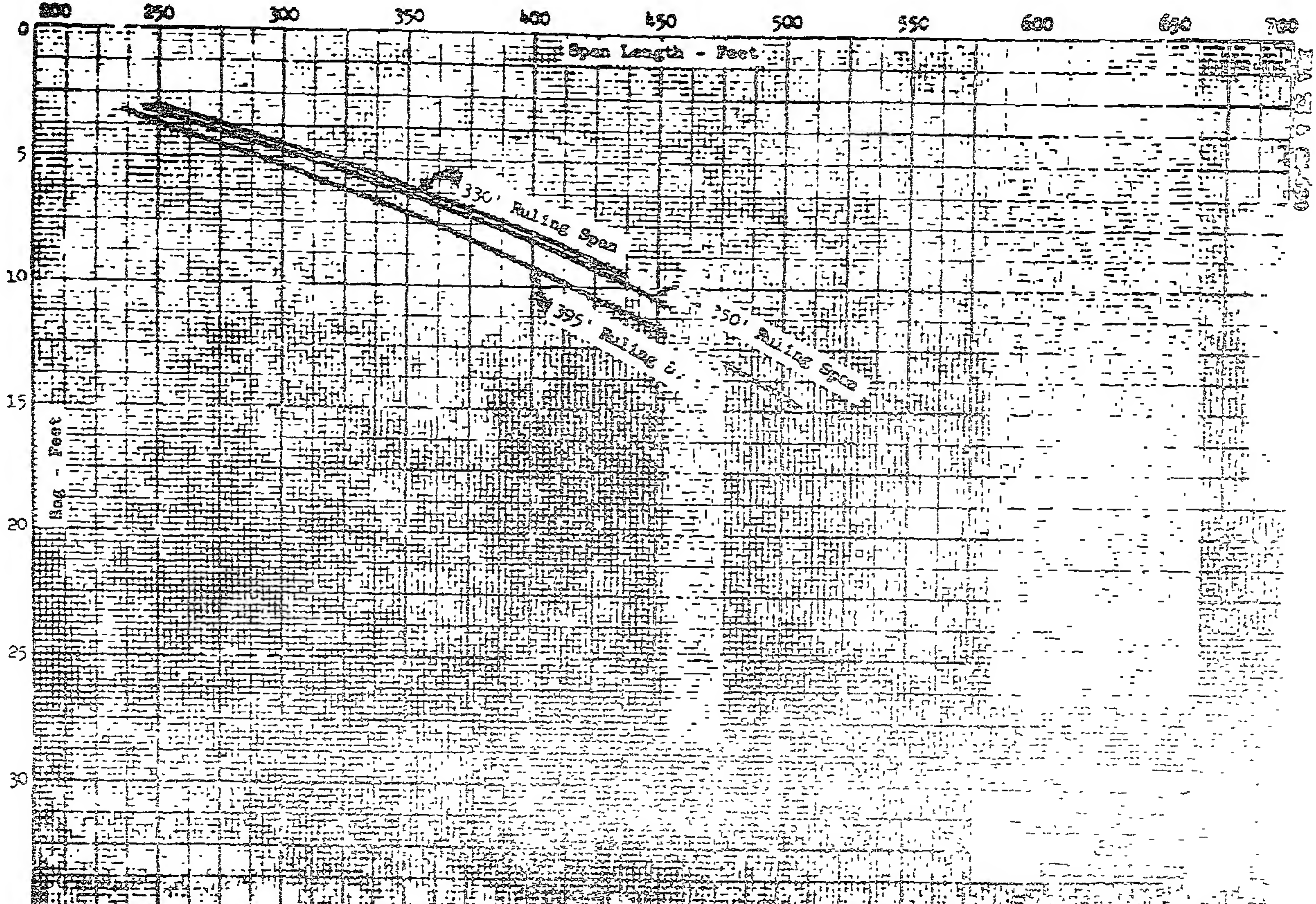


650
700
750
5
10
15
20
25
30
Sag - Feet
575' Ruling Span
500' Ruling Span
Final Unloaded Sag Curves
6A - Copperweld
Various Ruling Spans
60°F
MEDIUM LOADING

Figure 13

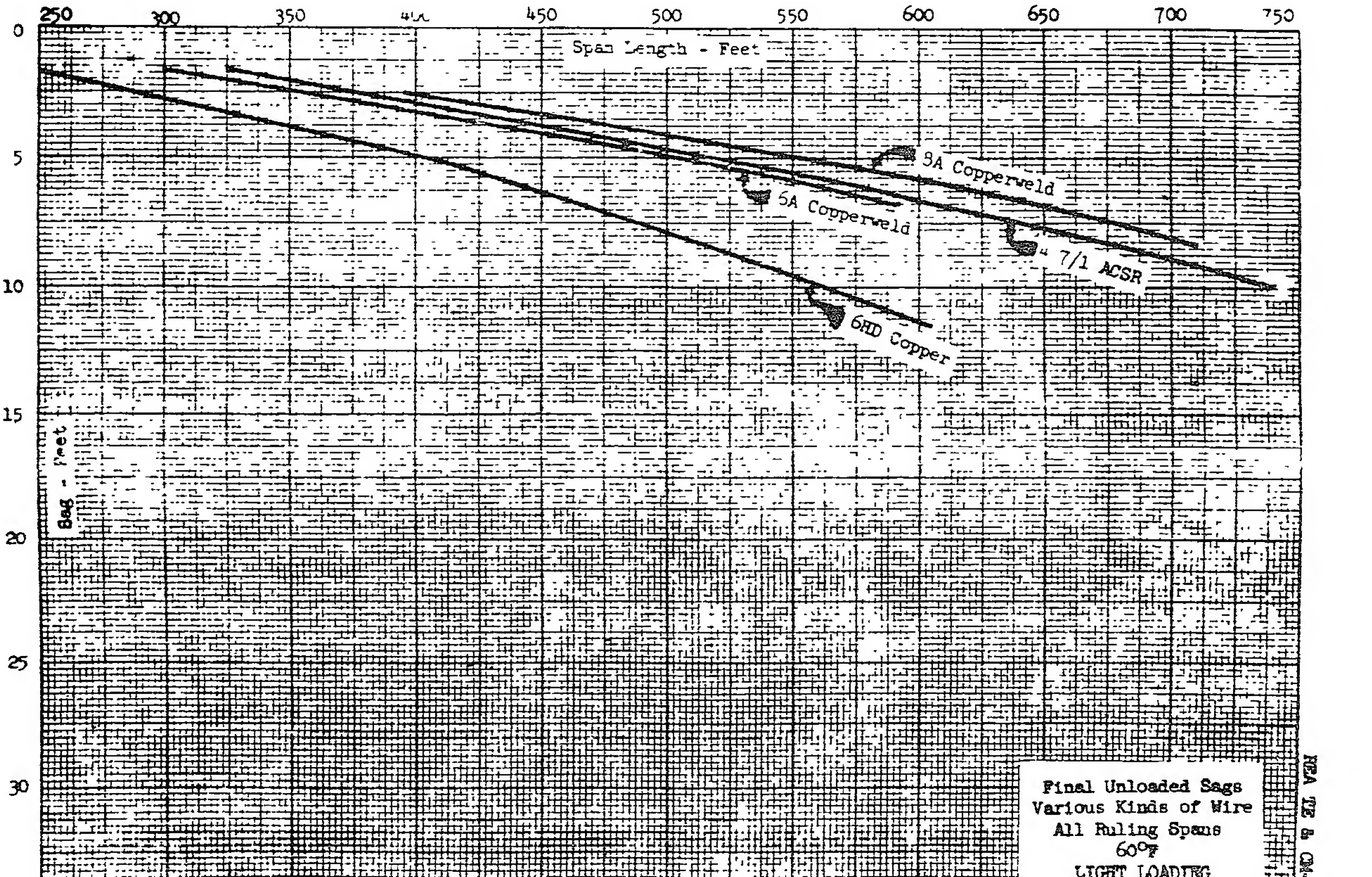


200
250
300
350
500
600
650
700
Span Length Feet
0
5
10
15
20
25
30
Sag - Feet
465' Ruling Span
590' Ruli.. Sp.
500' R..
Sag Curve
Ruling Spans



Span Length - Feet
200
250
300
350
400
450
500
550
600
650
700
Sag - Feet
0
5
10
15
20
25
30
330' Ruling Span
350' Ruling Span
395' Ruling S

Figure 15


REA TE & CM-
Final Unloaded Sags
Various Kinds of Wire
All Ruling Spans
60°F
LIGHT LOADING
Span Length - Feet
Sag - Feet
250
300
350
400
450
500
550
600
650
700
750
0
5
10
15
20
25
30
8A Copperweld
6A Copperweld
4 7/1 ACSR
6HD Copper

VERTICAL SEPARATION TABLES FOR TELEPHONE CONDUCTORS ON REA ELECTRIC POLE LINES - Feet	LOADING DISTRICT	POWER CONDUCTOR
When secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors.	Heavy	4-7/1 ACSR TELEPHONE CONDUCTOR All Cables Weighing .5# or less per ft

SPAN LENGTH FT	MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS									
	326 RULING SPAN		350 RULING SPAN		RULING SPAN		RULING SPAN		RULING SPAN	
	LOWER POWER COND		LOWER POWER COND.		LOWER POWER COND		LOWER POWER COND.		LOWER POWER COND.	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200	3.5	6.5	3.5	6.5						
210	"	"	"	"						
220	"	"	"	"						
230	"	"	"	"						
240	"	"	"	"						
250	"	"	"	"						
260	"	"	"	"						
270	"	"	"	"						
280	"	"	"	7.0						
290	"	"	"	"						
300	"	7.0	"	7.5						
310	"	"	"	8.0						
320	"	7.5	"	"						
330	"	"	4.0	8.5						
340										
350										
360										
370										
380										
390										
400										
410										
420										
430										
440										
450										
460										
470										
480										
490										
500										
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The data shown in this table reflect the following basic minimum requirements:

1 40-inch minimum separation at pole between neutral or secondary and highest telephone

[illegible] these tables do not include any consideration of minimum separation re- [illegible] power equipment is mounted on pole below the neutral).

[illegible] span separation between highest telephone conductor and neutral or

[illegible] secondaries up to 750 volts are involved.

[illegible] on REA pole head configurations with neutral 3½ feet below [illegible] occupying a position at top of pole and lowest secondary 3

RD-Figure No. 64

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES - Feet	LOADING DISTRICT	POWER CONDUCTOR 6 A CW
When secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors.		TELEPHONE CONDUCTOR .25# Cu. on 6M Str

SPAN LENGTH FT	MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS									
	354 RULING SPAN		RULING SPAN		RULING SPAN		RULING SPAN		RULING	
	LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER CO	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECON
200	3.5	6.5								
210	"	"								
220	"	"								
230	"	"								
240	"	"								
250	"	"								
260	"	"								
270	"	"								
280	"	"								
290	"	"								
300	"	"								
310	"	"								
320	"	"								
330	"	7.0								
340										
350										
360										
370										
380										
390										
400										
410										
420										
430										
440										
450										
460										
470										
480										
490										
500										
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The data shown in this table reflect the following basic minimum requirements

1. 40-inch minimum separation at pole between neutral or secondary and highest telephone conductor (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).
2. 30-inch minimum midspan separation between highest telephone conductor and neutral or secondaries.
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral.

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES - Feet

When secondaries are present or planned use column "Secondary". All separations shown are between neutral and telephone conductors.

LOADING DISTRICT: Heavy

POWER CONDUCTOR: 8A CW

TELEPHONE CONDUCTOR: .254 Ca. on 6M Strand

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

SPAN LENGTH FT	345 RULING SPAN		RULING SPAN		RULING SPAN		RULING SPAN		RULING SPAN	
	LOWER POWER COND		LOWER POWER COND		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200	35	65								
210	"	"								
220	"	"								
230	"	"								
240	"	"								
250	"	"								
260	"	"								
270	"	"								
280	"	"								
290	"	"								
300	"	"								
310	"	"								
320	"	7.0								
330	"	"								
340										
350										
360										
370										
380										
390										
400										
410										
420										
430										
440										
450										
460										
470										
480										
490										
500										
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The data shown in this table reflect the following basic minimum requirements:

1. 40-inch minimum separation at pole between neutral or secondary and highest telephone conductor (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).
2. 30-inch minimum midspan separation between highest telephone conductor and neutral or secondaries.
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral.

ED-Figure No. 66

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES - Feet

When secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors

LOADING DISTRICT: Heavy

POWER CONDUCTOR: 6 HD Copper

TELEPHONE CONDUCTOR: .25# Ca. on 6M Strand

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

SPAN LENGTH FT	175 RULING SPAN		223 RULING SPAN		274 RULING SPAN		325 RULING SPAN		RULING SPA	
	LOWER POWER COND.		LOWER POWER COND		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200	4.5	7.5	5.5	8.5	6.0	9.0	6.5	9.5		
210	"	"	"	"	6.5	9.5	7.0	10.0		
220	"	"	6.0	9.0	7.0	10.0	"	"		
230	5.0	8.0	"	"	"	"	7.5	10.5		
240	"	"	6.5	9.5	7.5	10.5	8.0	11.0		
250	"	8.5	7.0	10.0	8.0	11.0	8.5	11.5		
260	5.5	"	"	"	8.5	11.5	9.0	12.5		
270	"	9.0	7.5	11.0	"	12.5	9.5	13.5		
280	6.0	9.5	8.0	11.5	9.0	13.0	10.0	"		
290	"	10.0	8.5	12.5	9.5	13.5	10.5	14.5		
300	6.5	10.5	9.0	13.0	10.0	14.5	11.0	15.5		
310	"	11.0	9.5	13.5	11.0	15.5				
320	7.0	11.5	10.0	14.5						
330	7.5	12.0								
340										
350										
360										
370										
380										
390										
400										
410										
420										
430										
440										
450										
460										
470										
480										
490										
500										
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The data shown in this table reflect the following basic minimum requirements

1 40-inch minimum separation at pole between neutral or secondary and highest telephone conductor. (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).

2 30-inch minimum midspan separation between highest telephone conductor and neutral or secondaries.

3 Line of sight rule when secondaries up to 750 volts are involved.

4 All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral.

BD-Figure No. 6

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES - Feet	LOADING DISTRICT	POWER CONDUCTOR
	Heavy	6 HD Copper
n secondaries are present or planned use column "Secondary" All eparations shown are between neutral and telephone conductors		TELEPHONE CONDUCTOR: .5# Ca. on 6M Strand

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

PAN GTH	175 RULING SPAN		223 RULING SPAN		274 RULING SPAN		325 RULING SPAN		RULING SPAN	
	LOWER POWER COND		LOWER POWER COND		LOWER POWER COND		LOWER POWER COND		LOWER POWER COND	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
00	3.5	6.5	4.5	7.5	5.5	8.5	5.5	8.5		
10	4.0	"	5.0	8.0	"	"	6.0	9.0		
0	"	7.0	5.5	8.5	6.0	9.0	6.5	9.5		
10	"	7.5	"	9.0	"	9.5	"	10.0		
0	"	8.0	6.0	9.5	6.5	10.5	7.0	11.0		
0	4.5	8.0	6.0	10.0	7.0	11.0	7.5	11.5		
0	"	8.5	6.5	10.5	7.5	11.5	8.0	12.5		
0	"	9.0	7.0	11.0	8.0	12.5	9.0	13.0		
0	5.0	9.5	7.5	12.0	8.5	13.0	9.5	13.5		
0	5.5	10.0	8.0	12.5	9.5	14.0	10.0	14.5		
0	6.0	10.5	8.5	13.0	10.0	14.5	11.0	15.5		

e The data shown in this table reflect the following basic minimum requirements:
0-inch minimum separation at pole between neutral or secondary and highest telephone conductor (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral)
0-inch minimum midspan separation between highest telephone conductor and neutral or secondaries
Use of eight rule when secondaries up to 750 volts are involved
All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES – Feet

When secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors.

LOADING DISTRICT: Heavy

POWER CONDUCTOR: 6 HD Copper

TELEPHONE CONDUCTOR: .75# Co. on 6M Strand

SPAN LENGTH FT	MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS									
	175 RULING SPAN		223 RULING SPAN		274 RULING SPAN		RULING SPAN		RULING SPAN	
	LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200	3.5	6.5	4.0	7.5	5.0	8.0				
210	"	7.0	4.5	8.0	"	8.5				
220	"	"	5.0	8.5	5.5	9.0				
230	"	7.5	"	9.0	6.0	9.5				
240	"	8.0	"	9.5	"	10.5				
250	4.0	"	5.5	10.0	6.5	11.0				
260	"	8.5	6.0	10.5	7.0	11.5				
270	4.5	9.0	7.0	11.0	7.5	12.5				
280										
290										
300										
310										
320										
330										
340										
350										
360										
370										
380										
390										
400										
410										
420										
430										
440										
450										
460										
470										
480										
490										
500										
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The data shown in this table reflect the following basic minimum requirements:

1. 40-inch minimum separation at pole between neutral or secondary and highest telephone conductor. (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).
2. 30-inch minimum midspan separation between highest telephone conductor and neutral or secondaries.
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral.

HD-Figure No. 6

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES -- Feet

When secondaries are present or planned use column "Secondary". All separations shown are between neutral and telephone conductors

LOADING DISTRICT	POWER CONDUCTOR	TELEPHONE CONDUCTOR
Heavy	6 HD Copper	1.04 ... on 6M Strand

SPAN LENGTH FT.	MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS									
	175 RULING SPAN		223 RULING SPAN		274 RULING SPAN		RULING SPAN		RULING SPAN	
	LOWER POWER COND		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200	3.5	6.5	4.0	7.5	4.5	8.0				
210	"	7.0	"	8.0	"	8.5				
220	"	"	4.5	8.5	5.0	9.0				
230	"	7.5	"	9.0	5.5	10.0				
240	"	8.0	5.0	9.5	"	10.5				
250	4.0	"	5.5	10.0	6.0	11.0				
260										
270										
280										
290										
300										
310										
320										
330										
340										
350										
360										
370										
380										
390										
400										
410										
420										
430										
440										
450										
460										
470										
480										
490										
500										
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The de[illegible] shown [illegible] th[illegible] [illegible]le reflect the following basic minimum requirements:

1 40-inch minimum [illegible] pole between neutral or secondary and highest telephone conductor. (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).

minimum midspan separation between highest telephone conductor and neutral or

[illegible]daries up to 750 volts are involved.

[illegible]A pole head configurations with neutral 3½ feet below

[illegible]ing a position at top of pole and lowest secondary 3

VERTICAL SEPARATION TABLES FOR TELEPHONE CONDUCTORS ON REA ELECTRIC POLE LINES – Feet

When secondaries are present or planned, use column "Secondary". All separations [illegible]

LOADING DISTRICT	POWER CONDUCTOR	TELEPHONE CONDUCTOR
Heavy	6 HD Copper	[illegible] on 6M Strand

NONE CONDUCTORS

SPAN LENGTH FT	[illegible]		[illegible]		[illegible]		[illegible] SPAN		RULING	
	LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SEC
200	3.5	6.5	4.0	7.5	[illegible]	8.0				
210	"	7.0	4.5	8.0	"	8.5				
220	"	"	5.0	8.5	5.5	9.0				
230	"	7.5	"	9.0	6.0	9.5				
240	"	8.0	"	9.5	"	10.5				
250	4.0	"	5.5	10.0	6.5	11.0				
260	"	8.5	6.0	10.5	7.0	11.5				
270	4.5	9.0	7.0	11.0	7.5	12.5				
280										
290										
300										
310										
320										
330										
340										
350										
360										
370										
380										
390										
400										
410										
420										
430										
440										
450										
460										
470										
480										
490										
500										
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The data shown in this table reflect the following basic minimum requirements:

1 60-inch minimum separation at pole between neutral or secondary and highest telepho[ne] conductor. (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).

2 30-inch minimum midspan separation between highest telephone conductor and neutral secondaries.

3 Line of sight rule when secondaries up to 750 volts are involved.

4. All separations are based on REA pole head configurations with neutral 3½ feet belo[w] pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral.

HD-Figure

	VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES -- Feet	LOADING DISTRICT	POWER CONDUCTOR / TELEPHONE CONDUCTOR
	When secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors.	Heavy	4 7/1 ACSR / .54 Ga. on 10M Strand

SPAN LENGTH FT	325 RULING SPAN		350 RULING SPAN		387 RULING SPAN		450 RULING SPAN		500 RULING SPAN	
	MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS									
	LOWER POWER COND		LOWER POWER COND		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200										
210										
220										
230										
240										
250										
260										
270										
280										
290										
300	3.5	7.0	3.5	7.5	4.0	8.0	4.5	9.0	5.5	9.5
310	"	7.5	"	"	"	8.5	5.0	9.5	6.0	10.0
320	"	"	4.0	"	4.5	"	5.5	10.0	"	10.5
330	"	8.0	"	8.0	"	9.0	6.0	"	6.5	11.0
340	"	"	4.5	8.5	5.0	9.5	6.5	10.5	7.0	11.5
350	4.0	8.5	"	9.0	5.5	10.0	7.0	11.0	7.5	12.0
360	"	9.0	5.0	"	6.0	10.5	7.5	11.5	8.0	12.5
370	4.0	"	"	9.5	6.5	11.0	8.0	12.0	8.5	13.0
380	5.0	9.5	5.5	10.0	7.0	"	8.5	12.5	9.0	13.5
390	"	"	6.0	10.5	"	11.5	9.0	13.0	9.5	14.0
400	5.5	10.0	6.5	"	7.5	12.0	9.5	13.5	10.0	14.5
410	6.0	10.5	7.0	11.0	8.0	12.5	10.0	14.0	10.5	15.0
420	"	11.0	"	11.5	8.5	13.0	10.5	15.0	11.0	15.5
430	6.5	"	7.5	12.0	9.0	13.5	11.0	"	12.0	16.5
440	7.0	11.5	8.0	12.5	9.5	14.0	11.5	16.0	12.5	17.0
450	"	12.0	8.5	13.0	10.0	14.5	12.0	16.5	13.0	17.5
460			9.0	13.0	10.5	15.0	12.5	17.0		
470			"	13.5	11.0	15.5	13.0	17.5		
480					11.5	16.0				
490					12.0	16.5				
500										
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The data shown in this table reflect the following basic minimum requirements

1. 40-inch minimum separation at pole between neutral or secondary and highest telephone conductor (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).
2. 30-inch minimum midspan separation between highest telephone conductor and neutral or secondaries
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES -- Feet

LOADING DISTRICT	POWER CONDUCTOR	TELEPHONE CONDUCTOR
Heavy	6 HD Copper	.75# Ca. on 6M Strand

When secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors.

SPAN LENGTH FT	MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS									
	175 RULING SPAN		223 RULING SPAN		274 RULING SPAN		RULING SPAN		RULING S	
	LOWER POWER COND		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER CO	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECOND
200	3.5	6.5	4.0	7.5	5.0	8.0				
210	"	7.0	4.5	8.0	"	8.5				
220	"	"	5.0	8.5	5.5	9.0				
230	"	7.5	"	9.0	6.0	9.5				
240	"	8.0	"	9.5	"	10.5				
250	4.0	"	5.5	10.0	6.5	11.0				
260	"	8.5	6.0	10.5	7.0	11.5				
270	4.5	9.0	7.0	11.0	7.5	12.5				
280										
290										
300										
310										
320										
330										
340										
350										
360										
370										
380										
390										
400										
410										
420										
430										
440										
450										
460										
470										
480										
490										
500										
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The data shown in this table reflect the following basic minimum requirements:

1. 40-inch minimum separation at pole between neutral or secondary and highest telephone conductor. (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).
2. 30-inch minimum midspan separation between highest telephone conductor and neutral or secondaries
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral.

HD-Figure No.

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES - Feet

When secondaries are present or planned use column "Secondary". All [illegible]

LOADING DISTRICT	POWER CONDUCTOR	TELEPHONE CONDUCTOR
Heavy	4-7/1 ACSR	14 Ga. or 109 Strand

SPAN LENGTH FT.	LOWER POWER COND		LOWER POWER COND		LOWER POWER COND.		LOWER POWER COND		LOWER POWER COND.	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200										
210										
220										
230										
240										
250	3.5	6.5	3.5	6.5	3.5	6.5	3.5	7.5	3.5	7.5
260	"	"	"	6.5	"	"	"	"	4.0	8.0
270	"	"	"	"	"	"	"	8.0	"	8.5
280	"	6.5	"	7.0	"	7.0	4.0	8.5	4.5	"
290	"	"	"	"	"	8.0	4.5	"	"	9.0
300	"	7.0	"	7.5	4.0	"	"	9.0	5.0	9.5
310	"	"	"	"	"	8.5	5.0	9.5	5.5	10.0
320	"	7.5	"	8.0	4.5	9.0	5.5	10.0	6.0	10.5
330	"	"	4.0	"	5.0	"	6.0	10.5	6.5	11.0
340	"	8.0	4.5	8.5	"	9.5	6.5	"	7.0	11.5
350	4.0	"	"	9.0	5.5	10.0	7.0	11.0	7.5	12.0
360	"	8.5	5.0	9.5	6.0	10.5	7.5	11.5	8.0	12.5
370	4.5	9.0	"	"	6.5	11.0	8.0	12.0	8.5	13.0
380	5.0	"	5.5	10.0	7.0	"	8.5	12.5	9.0	13.5
390	"	9.5	6.0	10.5	7.5	11.5	"	13.0	9.5	14.0
400	5.5	10.0	6.5	11.0	"	12.0	9.5	13.5	10.0	14.5
410	6.0	"	7.0	"	8.0	12.5	10.0	14.0	10.5	15.0
420	"	10.5	"	11.5	8.5	13.0	10.5	15.0	11.0	15.5
430	6.5	11.0	7.5	12.0	9.0	13.5	11.0	15.5	12.0	16.0
440	7.0	"	8.0	12.5	9.5	14.0	11.5	16.0	12.5	17.0
450	"	11.5	8.5	13.0	10.0	14.5	12.0	16.5	13.0	17.5
460							12.5	17.0		
470							13.5	17.5		
480										
490										
500										
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The data shown in this table reflect the following basic minimum requirements

1. 40 inch minimum separation at pole between neutral or secondary and highest telephone conductor. (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).
2. 30-inch minimum midspan separation between highest telephone conductor and neutral or secondaries.
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES – Feet

When secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors

LOADING DISTRICT	POWER CONDUCTOR	TELEPHONE CONDUCTOR
Heavy	4 7/1 ACSR	.25 [illegible] Cu. on 10M Str[illegible]

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

SPAN LENGTH FT	325 RULING SPAN		350 RULING SPAN		387 RULING SPAN		450 RULING SPAN		500 RULING S[PAN]	
	LOWER POWER COND		LOWER POWER COND		LOWER POWER COND		LOWER POWER COND.		LOWER POWER CO[ND]	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECOND[ARY]
200										
210										
220										
230										
240										
250										
260										
270										
280										
290										
300	4.0	7.0	4.5	7.5	5.0	8.0	6.0	9.0	6.5	9
310	"	"	"	8.0	5.5	8.5	"	9.5	"	10.
320	"	7.5	"	"	"	9.0	6.5	10.0	7.0	10.
330	"	"	"	8.5	"	"	"	10.5	7.5	11
340	"	8.0	5.0	"	6.0	9.5	7.0	11.0	"	11
350	4.5	8.5	"	9.0	"	10.0	"	"	8.0	12.
360	"	"	"	9.5	"	10.5	7.5	11.5	"	12.
370	"	9.0	5.5	"	6.5	11.0	8.0	12.0	8.5	13
380	"	"	"	10.0	"	"	"	12.5	9.0	13
390	5.0	9.5	6.0	10.5	7.0	11.5	8.5	13.0	9.5	14
400	5.5	10.0	6.5	11.0	7.5	12.0	9.0	13.5	10.0	14
410	"	"	"	"	8.0	12.5	9.5	14.0	10.5	15
420	6.0	10.5	7.0	11.5	8.5	13.0	10.5	15.0	11.5	15
430	6.5	11.0	7.5	12.0	9.0	13.5	11.0	15.5	12.0	16
440	7.0	11.5	8.0	12.5	9.5	14.0	11.5	16.0	12.5	17
450			8.5	13.0	10.0	14.5	12.0	16.5	13.0	17
460			"	"	10.5	15.0	12.5	17.0		
470			9.0	13.5	11.0	15.5	13.0	17.5		
480					11.5	16.0				
490					12.0	16.5				
500										
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The data shown in this table reflect the following basic minimum requirements

1. 40-inch minimum separation at pole between neutral or secondary and highest telephone conductor. (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).
2. 30-inch minimum midspan separation between highest telephone conductor and neutral or secondaries
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral.

VERTICAL SEPARATION TABLES FOR TELEPHONE LINES BUILT ON REA ELECTRIC POLE LINES -- [illegible]	OPERATING DISTRICT	POWER CONDUCTOR
When secondaries are present or planned use column "Secondary". All separations shown are between neutral and telephone conductors.	Kenty	6A CW TELEPHONE CONDUCTOR .57 Ga. [illegible]

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

SPAN LENGTH FT	354 RULING SPAN		375 RULING SPAN		416 RULING SPAN		450 RULING SPAN		RULING SPAN	
	LOWER POWER COND		LOWER POWER COND		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200										
210										
220										
230										
240										
250	3.5	6.5	3.5	6.5	[illegible]	6.5	3.5	6.5		
260	"	"	"	"	"	"	"	"		
270	"	"	"	6.5	"	"	"	7.0		
280	"	6.5	"	"	"	7.0	"	"		
290	"	"	"	6.5	"	"	4.0	7.5		
300	"	"	"	"	"	7.5	"	8.0		
310	"	6.5	"	"	"	"	4.5	"		
320	"	"	"	7.0	"	8.0	"	8.5		
330	"	7.0	"	7.5	4.0	8.5	"	9.0		
340	"	"	"	"	"	"	5.0	"		
350	"	7.5	"	8.0	4.5	9.0	"	9.5		
360	"	"	"	"	5.0	"	5.5	10.0		
370	"	"	4.0	8.5	"	9.5	6.0	10.5		
380	"	8.0	"	"	5.5	10.0	6.5	"		
390	4.0	8.5	4.5	9.0	6.0	10.5	"	11.0		
400	"	"	5.0	9.5	6.5	"	7.0	11.5		
410	4.5	9.0	"	"	6.5	11.0	7.5	12.0		
420	"	"	5.5	10.0	7.0	11.5	8.0	12.5		
430	5.0	9.5	6.0	"	7.5	12.0	8.5	13.0		
440	5.5	"	"	10.5	8.0	12.5	9.0	13.5		
450	"	10.0	6.5	11.0	8.5	"	9.5	"		
460			7.0	11.5	"	13.0	10.0	14.0		
470			"	"	9.0	13.5	"	14.5		
480			7.5	12.0	9.5	14.0	11.0	15.0		
490					10.0	14.5	11.5	15.5		
500					10.5	15.0	12.0	16.0		
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The data shown in this table reflect the following basic minimum requirements:

1. 40-inch minimum separation at pole between neutral or secondary and highest telephone conductor. (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).
2. 30-inch minimum midspan separation between highest telephone conductor and neutral or secondaries.
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 8½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 8 feet below neutral.

[illegible]

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES - Feet	LOADING DISTRICT	POWER CONDUCTOR
	Heavy	4 7/1 ACSR
		TELEPHONE CONDUCTOR
		.75 # Ga. on 10M Strand

When secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors.

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

SPAN LENGTH FT.	325 RULING SPAN		350 RULING SPAN		387 RULING SPAN		450 RULING SPAN		500 RULING SPAN	
	LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200										
210										
220										
230										
240										
250	3.5	6.5	3.5	6.5	3.5	6.5	3.5	7.0	4.0	7.5
260	"	6.5	"	6.5	"	7.0	4.0	7.5	"	8.0
270	"	"	"	"	"	7.5	"	8.0	"	8.5
280	"	6.5	"	7.0	"	"	"	8.5	4.5	"
290	"	"	"	"	"	8.0	4.5	"	"	9.0
300	"	7.	"	7.5	4.0	"	5.0	9.0	5.0	9.5
310	"	"	"	"	"	8.5	"	9.5	5.5	10.0
320	"	7.	"	8.0	4.5	9.0	5.5	10.0	6.0	10.5
330	"	"	4.0	8.5	5.0	"	6.0	10.5	6.5	11.0
340	"	8.	4.5	"	"	9.5	6.5	"	7.0	11.5
350	4.0	"	"	9.0	5.5	10.0	7.0	11.0	7.5	12.0
360	4.5	8.	5.0	9.5	6.0	10.5	7.5	11.5	8.0	12.5
370	"	9.	5.5	"	6.5	11.0	8.0	12.0	8.5	13.0
380	5.0	"	"	10.0	7.0	"	8.5	12.5	9.0	13.5
390	"	9.	6.0	10.5	7.0	11.5	9.0	13.0	9.5	14.0
400	5.5	10.	6.5	11.0	7.5	12.0	9.5	13.5	10.5	14.5
410	6.0	"	7.0	"	8.0	12.5	10.0	14.0	11.0	15.0
420	"	10.	"	11.5	8.5	13.0	10.5	15.0	11.5	15.5
430	6.5	11.	7.5	12.0	9.0	13.5	11.0	15.5	12.0	16.0
440	7.0	"	8.0	12.5	9.5	14.0	11.5	16.0	12.5	17.0
450	"	11.	8.5	13.0	10.0	14.5	12.0	16.5	13.0	17.5
460										
470										
480										
490										
500										
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The dat shown in this table reflect the following basic minimum requirements:

1. 40-inch mini a separation at pole between neutral or secondary and highest telephone conductor. (These tables do not include any consideration of minimum separation requirements) a power equipment is mounted on pole below the neutral).
2. 30-inch min. m midspan separation between highest telephone conductor and neutral or secondaries.
3. Line of sigh rule when secondaries up to 750 volts are involved.
4. All separat ns are based on REA pole head configurations with neutral 3½ feet below pole top a phase wires occupying a position at top of pole and lowest secondary 3 feet below eutral.

RD-Figure No. 73

VERTICAL SEPARATION VALUES FOR TELEPHONE [illegible]
ON REA ELECTRIC POLE LINES [illegible]

When [illegible] are present or planned, [illegible]

ELECTRIC DISTRICT	POWER CO. [illegible]
Heavy	GA 61
	TELEPHONE CONDUCTOR
	[illegible]

SPAN LENGTH FT	[illegible] POWER NEUTRAL AND TELEPHONE CONDUCTORS									
	35½ RULING SPAN		[illegible]		[illegible] RULING SPAN		450 RULING SPAN		RULING SPAN	
	LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200										
210										
220										
230										
240										
250	3.5	6.5	3.5	6.5	[illegible]	6.5	3.5	6.5		
260	"	"	"	"	"	"	"	7.0		
270	"	"	"	"	"	"	"	"		
280	"	"	"	"	[illegible]	7.0	"	7.5		
290	"	"	"	"	"	"	"	"		
300	"	"	"	"	"	7.5	"	8.0		
310	"	"	"	7.0	"	"	4.0	8.5		
320	"	"	"	"	"	8.0	"	"		
330	"	7.0	"	7.5	4.0	"	4.5	9.0		
340	"	"	"	"	"	8.5	5.0	"		
350	"	7.5	"	8.0	4.5	9.0	"	9.5		
360	"	"	"	"	5.0	"	5.5	10.0		
370	"	8.0	4.0	8.5	"	9.5	6.0	10.5		
380	"	"	"	"	5.5	10.0	6.5	11.0		
390	4.0	8.5	4.5	9.0	6.0	10.5	"	"		
400	"	8.5	5.0	9.5	6.5	"	7.0	11.5		
410	4.5	9.0	"	"	"	11.0	7.5	12.0		
420	"	"	5.5	10.0	7.0	11.5	8.0	12.5		
430	5.0	9.5	6.0	"	7.5	12.0	8.5	13.0		
440	5.5	"	"	10.5	8.0	12.5	9.0	13.5		
450	"	10.0	6.5	11.0	8.5	"	9.5	14.0		
460			7.0	11.5	"	13.0	10.0	14.5		
470			"	"	9.0	13.5	"	"		
480			7.5	12.0	9.5	14.0	11.0	15.0		
490					10.0	14.5	11.5	16.0		
500					10.5	15.0	12.0	16.5		
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES. The data shown in this table reflect the following basic minimum requirements:

1. 40 inch minimum separation at pole between neutral or secondary and highest telephone conductor (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).
2. 10 inch minimum midspan separation between highest telephone conductor and neutral or secondaries.
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral.

ND-Figure No. 78

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES - Feet	LOADING DISTRICT	POWER CONDUCTOR
When secondaries are present or planned, use column "Secondary" All separations shown are between neutral and telephone conductors.	Heavy	6A CW TELEPHONE CONDUCTOR .25# Ca. on 10M Sts

SPAN LENGTH FT	MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS									
	354 RULING SPAN		375 RULING SPAN		416 RULING SPAN		450 RULING SPAN		RULING	
	LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER C	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECO
200										
210										
220										
230										
240										
250										
260										
270										
280										
290										
300	3.5	6.5	3.5	6.5	4.5	7.5	5.0	8.0		
310	"	"	"	7.0	"	"	"	8.5		
320	"	"	"	"	"	8.0	"	"		
330	"	7.0	"	7.5	"	8.5	5.5	9.0		
340	"	"	4.0	"	5.0	"	"	"		
350	"	7.5	"	8.0	"	9.0	"	9.5		
360	"	"	"	"	"	"	"	10.0		
370	"	8.0	"	8.5	"	9.5	6.0	10.5		
380	"	"	"	"	5.5	10.0	"	11.0		
390	4.0	8.5	4.5	9.0	6.0	10.5	6.5	"		
400	"	"	5.0	9.5	6.5	11.0	7.0	11.5		
410	4.5	9.0	"	"	"	"	7.5	12.0		
420	"	"	5.5	10.0	7.0	11.5	8.0	12.5		
430	5.0	9.5	6.0	"	7.5	12.0	8.5	13.0		
440	5.5	10.0	"	10.5	8.0	12.5	9.0	13.5		
450	"	"	6.5	11.0	8.5	13.0	9.5	"		
460			7.0	11.5	"	"	10.0	14.0		
470			"	"	9.0	13.5	10.5	14.5		
480			7.5	12.0	9.5	14.0	11.0	15.0		
490					10.0	14.5	11.5	15.5		
500					10.5	15.0	12.0	16.0		
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The data shown in this table reflect the following basic minimum requirements

1. 40-inch minimum separation at pole between neutral or secondary and highest telephone conductor (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).
2. 30-inch minimum midspan separation between highest telephone conductor and neutral or secondaries
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral

HD-Figure N

VERTICAL SEPARATION TABLES FOR TELEPHONE CONDUCTORS ON REA ELECTRIC POLE LINES -- Feet	LOADING DISTRICT	POWER CONDUCTOR
	Heavy	8A CW
When secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors.		TELEPHONE CONDUCTOR: .5# Cu. on 10M Strand

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

SPAN LENGTH FT	345 RULING SPAN		375 RULING SPAN		400 RULING SPAN		450 RULING SPAN		RULING SPAN	
	LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200										
210										
220										
230										
240										
250	3.5	6.5	3.5	6.5	3.5	6.5	4.0	7.0		
260	"	"	"	"	"	"	"	7.5		
270	"	"	"	"	"	7.0	4.5	"		
280	"	"	"	"	"	"	"	8.0		
290	"	"	"	7.0	4.0	7.5	"	"		
300	"	"	"	"	"	8.0	"	8.5		
310	"	"	"	7.5	"		5.0	9.0		
320	"	7.0	"	8.0	"	8.5	"	9.5		
330	"		"	"	4.5	"	5.5	"		
340	"	7.5	4.0	8.5	"	9.0	"	10.0		
350	"	"	"	"	5.0	9.5	6.0	10.5		
360	"	8.0	4.5	9.0	5.5	10.0	6.5	11.0		
370	"	"	5.0	9.5	6.0	"	7.0	11.5		
380	4.0	8.5	5.5	"	"	10.5	7.5	12.0		
390	4.5	"	"	10.0	6.5	11.0	8.0	12.5		
400	"	9.0	6.0	10.5	7.0	11.5	8.5	13.0		
410	5.0	9.5	6.5	11.0	7.5	12.0	9.0	13.5		
420	"	"	"	"	8.0	"	9.5	"		
430	5.5	10.0	7.0	11.5	"	12.5	10.0	14.0		
440	6.0	10.5	7.5	12.0	8.5	13.0	10.5	14.5		
450	"	"	8.0	12.5	9.0	13.5	11.0	15.0		
460	6.5	11.0	8.5	13.0	9.5	14.0	11.5	15.5		
470	"	"	9.0	"	10.0	14.5	12.0	16.0		
480	7.0	11.5	9.5	13.5	10.5	15.0	12.5	16.5		
490	7.5	12.0	"	14.0	11.0	15.5	13.5	17.0		
500	8.0	"	10.0	14.5	11.5	16.0	14.0	18.0		
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES The data shown in this table reflect the following basic minimum requirements.

1. 40 inch minimum separation at pole between neutral or secondary and highest telephone conductor. (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral.)
2. 30-inch minimum midspan separation between highest telephone conductor and neutral or secondaries.
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations apply to REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral.

ED-Figure No. 80

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES - Feet

LOADING DISTRICT: Heavy

POWER CONDUCTOR: 6A CW

TELEPHONE CONDUCTOR: .75# Co. [illegible]

When secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors.

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

SPAN LENGTH FT	354 RULING SPAN		375 RULING SPAN		416 RULING SPAN		450 RULING SPAN		RULING SPAN	
	LOWER POWER COND.		LOWER POWER COND		LOWER POWER COND.		LOWER POWER COND		LOWER POWER COND	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200										
210										
220										
230										
240										
250	3.5	6.5	3.5	6.5	3.5	6.5	3.5	6.5		
260	"	"	"	"	"	"	"	"		
270	"	"	"	"	"	"	"	7.0		
280	"	"	"	"	"	7.0	"	"		
290	"	"	"	"	"	"	"	7.5		
300	"	"	"	"	"	7.5	"	8.0		
310	"	"	"	7.0	"	"	4.0	"		
320	"	"	"	"	"	8.0	"	8.5		
330	"	7.0	"	7.5	4.0	8.5	4.5	9.0		
340	"	"	"	"	"	"	5.0	"		
350	"	7.5	"	8.0	4.5	9.0	"	9.5		
360	"	"	"	"	5.0	"	5.5	10.0		
370	"	"	4.0	8.5	"	9.5	6.0	10.5		
380	"	8.0	"	"	5.5	10.0	6.5	"		
390	4.0	8.5	4.5	9.0	6.0	10.5	"	11.0		
400	"	"	5.0	9.5	6.5	"	7.0	11.5		
410	4.5	9.0	"	"	"	11.0	7.5	12.0		
420	"	"	5.5	10.0	7.0	11.5	8.0	12.5		
430	5.0	9.5	6.0	"	7.5	12.0	8.5	13.0		
440	5.5	"	"	10.5	8.0	12.5	9.0	13.5		
450	"	10.0	6.5	11.0	8.5	"	9.5	"		
460			7.0	11.5	"	13.0	10.0	14.0		
470			"	"	9.0	13.5	"	14.5		
480			7.5	12.0	9.5	14.0	11.0	15.0		
490					10.0	14.5	11.5	15.5		
500					10.5	15.0	12.0	16.0		
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES. The data shown in this table reflect the following basic minimum requirements

1. 40-inch minimum separation at pole between neutral or secondary and highest telephone conductor (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).
2. 30-inch minimum midspan separation between highest telephone conductor and neutral or secondaries.
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral.

FD-Figure No. 77

[illegible]RTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES - Feet

LOADING DISTRICT	POWER CONDUCTOR
Heavy	8A (d)
	TELEPHONE CONDUCTOR
	1-# [illegible] on 10M Strand

[illegible]ondaries are present or planned use column "Secondary" All [illegible] shown are between neutral and telephone conductors.

[illegible]

3½ [illegible]		(75 [illegible]		[illegible]		150 [illegible]		[illegible]	
LOWER POWER COND		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND	
NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
3.5	6.5	3.5	6.5	3.5	6.5	3.5	7.0		
"	"	"	"	"	"	"	"		
"	"	"	"	"	7.0	"	7.5		
"	"	"	"	"	"	"	8.0		
"	"	"	7.0	"	7.5	4.0	"		
"	"	"	"	"	8.0	"	8.5		
"	"	"	7.5	"	"	4.5	9.0		
"	7.0	"	"	4.0	8.5	5.0	9.5		
"	"	"	8.0	4.5	"	5.5	"		
"	7.5	4.0	8.5	"	9.0	6.0	10.0		
"	"	4.5	"	5.0	9.5	"	10.5		
"	8.0	"	9.0	5.5	"	6.5	11.0		
"	"	5.0	9.5	6.0	10.0	7.5	11.5		
4.0	8.5	5.5	"	"	10.5	"	12.0		
4.5	"	"	10.0	6.5	11.0	8.0	12.5		
"	9.0	6.0	10.5	7.0	11.5	8.5	13.0		
5.0	"	6.5	11.0	7.5	12.0	9.0	13.5		
"	9.5	7.0	"	8.0	"	9.5	"		
5.5	10.0	"	11.5	8.5	12.5	10.0	14.0		
6.0	"	7.5	12.0	"	13.0	10.5	14.5		
"	10.5	8.0	12.5	9.0	13.5	11.0	15.0		
6.5	11.0	8.5	13.0	9.5	14.0	11.5	16.0		
"	"	9.0	"	10.0	14.5	12.0	16.5		
7.0	11.5	9.5	13.5	10.5	15.0	12.5	17.0		
7.5	12.0	"	14.0	11.0	15.5	13.5	17.5		
8.0	"	10.0	14.5	11.5	16.0	14.0	18.5		

The data shown in this table reflect the following basic minimum requirements
[illegible]ach minimum separation at pole between neutral or secondary and highest telephone [illegible]uctor (These tables do not include any consideration of minimum separation re[illegible]ements when power equipment is mounted on pole below the neutral).
[illegible]ach minimum midspan separation between highest telephone conductor and neutral or [illegible]ndaries
[illegible] of sight rule when secondaries up to 750 volts are involved
[illegible] separations are based on REA pole head configurations with neutral 3½ feet below [illegible] top and phase wires occupying a position at top of pole and lowest secondary 3 [illegible] below neutral

RD-Figure No. 82

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES Feet	LOADING DISTRICT	POWER CONDUCTOR
	Heavy	8A CW
		TELEPHONE CONDUCTOR
When secondaries are present or planned use column "Secondary". All separations shown are between neutral and telephone conductors.		.25 # Co. on 10M Strand

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

SPAN LENGTH FT	345 RULING SPAN		375 RULING SPAN		400 RULING SPAN		450 RULING SPAN		RULING SPAN	
	LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND		LOWER POWER COND	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200										
210										
220										
230										
240										
250										
260										
270										
280										
290										
300	3.5	6.5	4.0	7.0	4.5	8.0	5.5	8.5		
310	"	"	4.5	7.5	5.0	"	6.0	9.0		
320	"	7.0	"	8.0	"	8.5	"	9.5		
330	"	"	"	"	"	9.0	"	10.0		
340	"	7.5	"	8.5	5.5	"	6.5	"		
350	"	"	"	"	"	9.5	"	10.5		
360	"	8.0	5.0	9.0	"	10.0	"	11.0		
370	4.0	"	"	9.5	6.0	"	7.5	11.5		
380	"	8.5	"	"	"	10.5	"	12.0		
390	"	"	5.5	10.0	6.5	11.0	8.0	12.5		
400	4.5	9.0	6.0	10.5	7.0	11.5	8.5	13.0		
410	5.0	9.5	6.5	11.0	7.5	12.0	9.0	13.5		
420	"	"	"	"	8.0	"	9.5	"		
430	5.5	10.0	7.0	11.5	8.5	12.5	10.0	14.0		
440	6.0	10.5	7.5	12.0	"	13.0	10.5	14.5		
450	"	"	8.0	12.5	9.0	13.5	11.0	15.5		
460	6.5	11.0	8.5	13.0	[illegible]	14.0	11.5	16.0		
470	7.0	11.5	9.0	"	10.0	14.5	12.0	16.5		
480	"	"	9.5	13.5	10.5	15.0	12.5	17.0		
490	7.5	12.0	"	14.0	11.0	15.5	13.5	17.5		
500	8.0	12.5	10.0	14.5	11.5	16.0	14.0	18.5		
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The data shown in this table reflect the following basic minimum requirements:

1. 40-inch minimum separation at pole between neutral or secondary and highest telephone conductor (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).
2. 30 inch minimum midspan separation between highest telephone conductor and neutral or secondaries
3. Line of sight rule when secondaries up to 750 volts are involved
4. All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral.

RD-Figure No. 79

VERTICAL SEPARATION TABLES FOR TELEPHONE CONDUCTORS ON REA ELECTRIC POLE LINES – Feet

secondaries are present or planned use column "Secondary". All tions shown are between neutral and telephone conductors.

LOADING DISTRICT	POWER CONDUCTOR	TELEPHONE CONDUCTOR
Medium	6A CW	All cables weighing 1# or less on 6M strand

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

450 RULING SPAN		500 RULING SPAN		575 RULING SPAN		RULING SPAN		RULING SPAN	
LOWER POWER COND		LOWER POWER COND		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND	
NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
3.5	6.5	3.5	6.5	3.5	6.5				
"	"	"	"	"	"				
"	"	"	"	"	"				
"	"	"	"	"	"				
"	"	"	"	"	"				
"	"	"	"	"	"				
"	"	"	"	"	"				
"	"	"	"	"	"				
"	"	"	"	"	"				
"	"	"	"	"	"				
"	"	"	"	"	"				
"	"	"	"	"	"				
"	"	"	"	"	"				
"	"	"	"	"	"				
"	"	"	"	"	"				
"	"	"	"	"	"				
"	"	"	"	"					
					7.0				
"		"		"	"				
	7.0		7.0						
"	"	"	"	"	"				
"	"	"	"	"					
					7.5				
"	"	"		"	"				
			7.5						

The data shown in this table reflect the following basic minimum requirements:
Inch minimum separation at pole between neutral or secondary and highest telephone conductor (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral)
Inch minimum midspan separation between highest telephone conductor and neutral or secondaries
ne of sight rule when secondaries up to 750 volts are involved.
l separations are based on REA pole head configurations with neutral 3½ feet below the top and phase wires occupying a position at top of pole and lowest secondary 3 et below neutral

ED-Figure No. 84

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES – Feet

When secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors.

LOADING DISTRICT: Heavy

POWER CONDUCTOR: [illegible]

TELEPHONE CONDUCTOR: [illegible]

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

SPAN LENGTH FT.	345 RULING SPAN		375 RULING SPAN		400 RULING SPAN		450 RULING SPAN		RULING SPAN	
	LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200										
210										
220										
230										
240										
250	3.5	6.5	3.5	6.5	3.5	6.5	3.5	7.0		
260	"	"	"	"	"	"	"	"		
270	"	"	"	"	"	7.0	"	7.5		
280	"	"	"	"	"	"	"	8.0		
290	"	"	"	7.0	"	7.5	4.0	"		
300	"	"	"	"	"	8.0	"	8.5		
310	"	"	"	7.5	"	"	4.5	9.0		
320	"	7.0	"	8.0	4.0	8.5	5.0	9.5		
330	x	"	"	"	4.5	"	5.5	"		
340	"	7.5	4.0	8.5	"	9.0	"	10.0		
350	"	"	4.5	"	5.0	9.5	6.0	10.5		
360	"	8.0	"	9.0	5.5	10.0	6.5	11.0		
370	"	"	5.0	9.5	6.0	"	7.0	11.5		
380	4.0	8.5	5.5	"	"	10.5	7.5	12.0		
390	4.5	"	"	10.0	6.5	11.0	8.0	12.5		
400	"	9.0	6.0	10.5	7.0	11.5	8.5	13.0		
410	5.0	9.5	6.5	11.0	7.5	12.0	9.0	13.5		
420	"	"	"	"	8.0	"	9.5	"		
430	5.5	10.0	7.0	11.5	8.5	12.5	10.0	14.0		
440	6.0	"	7.5	12.0	"	13.0	10.5	14.5		
450	"	10.5	8.0	12.5	9.0	13.5	11.0	15.5		
460	6.5	11.0	8.5	13.0	9.5	14.0	11.5	16.0		
470	"	"	9.0	"	10.0	14.5	12.0	16.5		
480	7.0	11.5	9.5	13.5	10.5	15.0	12.5	17.0		
490	7.5	12.0	"	14.0	11.0	15.5	13.5	17.5		
500	8.0	"	10.0	14.5	11.5	16.0	14.0	18.0		
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The data shown in this table reflect the following basic minimum requirements:

1. 40-inch minimum separation at pole between neutral or secondary and highest telephone conductor (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).
2. 30-inch minimum midspan separation between highest telephone conductor and neutral or secondaries.
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and, lowest secondary 3 feet below neutral.

RE-Figure [illegible]

VERTICAL SEPARATION TABLES FOR TELEPHONE & ELECTRIC
ON REA ELECTRIC POLE LINES ... Feet

When secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors

LOADING DISTRICT: Medium

POWER CONDUCTOR: 6 HD Copper

TELEPHONE CONDUCTOR: All cables weighing 1.# or less on 6M strand

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

SPAN LENGTH FT	330 RULING SPAN		350 RULING SPAN		395 RULING SPAN		RULING SPAN		RULING SPAN	
	LOWER POWER COND		LOWER POWER COND		LOWER POWER COND		LOWER POWER COND		LOWER POWER COND	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200										
210										
220										
230										
240										
250	3.5	6.5	3.5	6.5	3.5	6.5				
260	"	"	"	"	"	7.0				
270	"	"	"	7.0	"	7.5				
280	"	7.0	"	"	4.0	"				
290	"	"	"	7.5	"	8.0				
300	"	7.5	"	8.0	"	8.5				
310	"	"	"	"	"	"				
320	"	8.0	4.0	8.5	4.5	9.0				
330	4.0	8.5	4.5	"	5.0	9.5				
340	4.5	"	"	9.0	5.5	10.0				
350	"	9.0	5.0	9.5	6.0	"				
360	5.0	9.5	5.5	10.0	"	10.5				
370	5.5	"	6.0	"	6.5	11.0				
380	"	10.0	"	10.5	7.0	11.5				
390	6.0	10.5	6.5	11.0	7.5	12.0				
400	6.5	11.0	7.0	11.5	8.0	12.5				
410	7.0	"	7.5	12.0	8.5	13.0				
420	7.5	11.5	8.0	"	9.0	13.5				
430	"	12.0	8.5	12.5	9.5	14.0				
440	8.0	12.5	"	13.0	"	14.5				
450	8.5	13.0	9.0	13.5	10.0	1'.0				
460										
470										
480										
490										
500										
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES. The data shown in this table reflect the following basic minimum requirements:

1. 40-inch minimum separation at pole between neutral or secondary and highest telephone conductor. (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral)
2. 30-inch minimum midspan separation between highest telephone conductor and neutral or secondaries
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral

HD-Figure No. 86

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES - Feet

When secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors.

LOADING DISTRICT: Medium

POWER CONDUCTOR: 4-7/1 ACSR

TELEPHONE CONDUCTOR: All, ca... ing 1.# or 10/18 on ...

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS.

SPAN LENGTH FT.	405 RULING SPAN		540 RULING SPAN		RULING SPAN		RULING SPAN		RULING	
	LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER C...	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECO...
200										
210										
220										
230										
240										
250	3.5	6.5	3.5	6.5						
260	"	"	"	"						
270	"	"	"	"						
280	"	"	"	"						
290	"	"	"	"						
300	"	"	"	"						
310	"	"	"	"						
320	"	"	"	"						
330	"	"	"	"						
340	"	"	"	"						
350	"	"	"	"						
360	"	"	"	"						
370	"	"	"	"						
380	"	"	"	7.0						
390	"	"	"	"						
400	"	7.0	"	"						
410	"	"	"	7.5						
420	"	"	"	"						
430	"	7.5	"	8.0						
440	"	"	"	"						
450	"	8.0	4.0	8.5						
460										
470										
480										
490										
500										
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The data shown in this table reflect the following basic minimum requirements:

1. 40-inch minimum separation at pole between neutral or secondary and highest telepho... conductor. (These tables do not include any consideration of minimum separation re... quirements when power equipment is mounted on pole below the neutral).
2. 30-inch minimum midspan separation between highest telephone conductor and neutral secondaries
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 3½ feet bel... pole top and phase wires occupying a position at top of pole and lowest secondary feet below neutral

RD-Figure

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES – Feet	LOADING DISTRICT	POWER CONDUCTOR
When secondaries are present or planned use column "Secondary. All separations shown are between neutral and telephone conductors	Medium	4A CW
		TELEPHONE CONDUCTOR All cables weighing 1# or less on 10M strand.

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

SPAN LENGTH FT	450 RULING SPAN		500 RULING SPAN		575 RULING SPAN		RULING SPAN		RULING SPAN	
	LOWER POWER COND		LOWER POWER COND		LOWER POWER COND		LOWER POWER COND		LOWER POWER COND	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200										
210										
220										
230										
240										
250										
260										
270										
280										
290										
300										
310										
320										
330										
340										
350	3.5	6.5	3.5	6.5	3.5	6.5				
360	"	"	"	"	"	"				
370	"	"	"	"	"	"				
380	"	"	"	"	"	"				
390	"	"	"	"	"	"				
400	"	"	"	"	"	"				
410	"	"	"	"	"	7.0				
420	"	"	"	7.0	"	"				
430	"	7.0	"	"	"	"				
440	"	"	"	"	"	7.5				
450	"	"	"	7.5	"	"				
460	"	7.5	"	"	"	8.0				
470	"	"	"	"	"	"				
480	"	8.0	"	8.0	"	"				
490	"	"	"	"	4.0	8.5				
500	"	"	4.0	8.5	"	"				
510	4.0	8.5	"	"	4.5	9.0				
520	"	"	4.5	9.0	"	"				
530	4.5	9.0	"	"	5.0	9.5				
540	"	"	5.0	"	"	"				
550	5.0	"	"	9.5	5.5	10.0				
560	"	9.5	"	"	"	"				
570	5.5	"	5.5	10.0	6.0	"				
580	"	10.0	"	"	"	10.5				
590	6.0	"	6.0	10.5	6.5	11.0				
600										

NOTES The data shown in this table reflect the following basic minimum requirements:

1 40 inch minimum separation at pole between neutral or secondary and highest telephone conductor (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).

2 30 inch minimum midspan separation between highest telephone conductor and neutral or secondaries

3 Line of sight rule when secondaries up to 750 volts are involved.

4 All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral

ED-Figure No. 68

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES – Feet

When secondaries are present or planned use column "Secondary". All separations shown are between neutral and telephone conductors.

LOADING DISTRICT	POWER CONDUCTOR
Medium	8A CW
	TELEPHONE CONDUCTOR All c… weighing 1.# or lo… strand

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

SPAN LENGTH FT	465 RULING SPAN		500 RULING SPAN		590 RULING SPAN		RULING SPAN		RULING …	
	LOWER POWER COND.		LOWER POWER COND		LOWER POWER COND.		LOWER POWER COND		LOWER POWER …	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SEC…
200										
210										
220										
230										
240										
250	3.5	6.5	3.5	6.5	3.5	6.5				
260	"	"	"	"	"	"				
270	"	"	"	"	"	"				
280	"	"	"	"	"	"				
290	"	"	"	"	"	"				
300	"	"	"	"	"	"				
310	"	"	"	"	"	"				
320	"	"	"	"	"	"				
330	"	"	"	"	"	"				
340	"	"	"	"	"	"				
350	"	"	"	"	"	"				
360	"	"	"	"	"	"				
370	"	"	"	"	"	"				
380	"	"	"	"	"	"				
390	"	"	"	"	"	"				
400	"	"	"	"	"	"				
410	"	"	"	"	"	"				
420	"	"	"	"	"	7.0				
430	"	"	"	"	"	"				
440	"	"	"	7.0	"	"				
450	"	"	"	"	"	7.5				
460										
470										
480										
490										
500										
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The data shown in this table reflect the following basic minimum requirements.

1. 40-inch minimum separation at pole between neutral or secondary and highest telephone conductor (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral)
2. 30 inch minimum midspan separation between highest telephone conductor and neutral or secondaries
3. Line of sight rule when secondaries up to 750 volts are involved
4. All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 2 feet below neutral

RD-Figure No…

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES – Feet	LOADING DISTRICT	POWER CONDUCTOR
When secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors.	Medium	6 HD Copper TELEPHONE CONDUCTOR All cables weighing 1# or less on 10M strand.

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

SPAN LENGTH FT	330 RULING SPAN		350 RULING SPAN		395 RULING SPAN		RULING SPAN		RULING SPAN	
	LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200										
210										
220										
230										
240										
250										
260										
270										
280										
290										
300										
310										
320										
330										
340										
350	4.5	9.0	5.0	9.5	6.0	10.0				
360	5.0	9.5	5.5	10.0	"	10.5				
370	5.5	"	6.0	"	6.5	11.0				
380	"	10.0	"	10.5	7.0	11.5				
390	6.0	10.5	6.5	11.0	7.5	12.0				
400	6.5	11.0	7.0	11.5	8.0	12.5				
410	7.0	"	7.5	12.0	8.5	13.0				
420	"	11.5	8.0	"	9.0	13.5				
430	7.5	12.0	"	12.5	9.5	14.0				
440	8.0	12.5	8.5	13.0	10.0	14.5				
450	8.5	13.0	9.0	13.5	10.5	15.0				
460	"	13.5	9.5	14.0	11.0	15.5				
470	9.0	"	10.0	14.5	11.5	16.0				
480	9.5	14.0	10.5	15.0						
490	10.0	14.5	11.0	15.5						
500	10.5	15.0	11.5	16.0						
510	11.0	15.5	12.0	16.5						
520	11.5	16.0								
530	12.0	16.5								
540										
550										
560										
570										
580										
590										
600										

NOTES The data shown in this table reflect the following basic minimum requirements:

1 40 inch minimum separation at pole between neutral or secondary and highest telephone conductor (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral)

2 30 inch minimum midspan separation between highest telephone conductor and neutral or secondaries

3 line of sight rule when secondaries up to 750 volts are involved

4 All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral

RD-Figure No. 90

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD
ON REA ELECTRIC POLE LINES -- Feet

When secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors

LOADING DISTRICT: Medium

POWER CONDUCTOR: 4 7/1 ACSR

TELEPHONE CONDUCTOR: All ca weighing 1.# or les strand.

SPAN LENGTH FT	MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS									
	425 RULING SPAN		542 RULING SPAN		RULING SPAN		RULING SPAN		RULING S	
	LOWER POWER COND		LOWER POWER COND		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER CO	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECON
200										
210										
220										
230										
240										
250										
260										
270										
280										
290										
300										
310										
320										
330										
340										
350	3.5	6.5	3.5	6.5						
360	"	"	"	"						
370	"	"	"	"						
380	"	"	"	7.0						
390	"	"	"	"						
400	"	7.0	"	"						
410	"	"	"	7.5						
420	"	"	"	"						
430	"	7.5	"	8.0						
440	"	"	"	"						
450	"	8.0	4.0	8.5						
460	"	"	"	"						
470	4.0	"	4.5	9.0						
480	"	8.5	"	"						
490	4.5	"	5.0	9.5						
500	"	9.0	"	"						
510	5.0	"	5.5	10.0						
520	"	9.5	"	"						
530	5.5	"	6.0	10.5						
540	"	10.0	"	"						
550	6.0	"	6.5	11.0						
560	"	10.5	"	"						
570	6.5	"	7.0	11.5						
580	"	11.0	7.5	12.0						
590	7.0	11.5	"	"						
600	"	11.5	8.0	12.5						

NOTES: The data shown in this table reflect the following basic minimum requirements

1 40 inch minimum separation at pole between neutral or secondary and highest telephon conductor. (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral)

2 30 inch minimum midspan separation between highest telephone conductor and neutral o secondaries

3 Line of sight rule when secondaries up to 750 volts are involved.

4 All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral.

~~Figure 1~~

VERTICAL SEPARATION TABLES FOR TELEPHONE CONDUCTORS ON REA ELECTRIC POLE LINES - Feet	LOADING DISTRICT	POWER CONDUCTOR
If secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors.	Light	6A CW
		TELEPHONE CONDUCTOR All cables weighing 1# or less on 6M strand.

SPAN LENGTH FT	MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS									
	All RULING SPANS		RULING SPAN		RULING SPAN		RULING SPAN		RULING SPAN	
	LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200										
210										
220										
230										
240										
250										
260										
270										
280										
290										
300	3.5	5.0								
10	"	"								
20	"	"								
30	"	5.5								
40	"	"								
50	"	"								
60	"	"								
70	"	6.0								
80	"	"								
90	"	"								
00	"	6.5								
10										
20										
30										
40										
50										
60										
70										
80										
90										
0										
0										
0										
0										
0										
0										
0										

ES. The data shown in this table reflect the following basic minimum requirements:
40 inch minimum separation at pole between neutral or secondary and highest telephone conductor (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).
30-inch minimum midspan separation between highest telephone conductor and neutral or secondaries
Use of eight rule when secondaries up to 750 volts are involved.
All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral.

RD-Figure No. 92

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES – Feet	LOADING DISTRICT: Medium	POWER CONDUCTOR: 8A CW TELEPHONE CONDUCTOR: A… ing 1/8 or less

When secondaries are present or planned, see column "Secondary". All separations shown are between neutral and telephone conductors.

SPAN LENGTH FT	MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCT…								
	465 RULING SPAN		500 RULING SPAN		590 RULING SPAN		RULING SPAN		RU…
	LOWER POWER COND		LOWER POWER COND.		LOWER POWER COND		LOWER POWER COND		LOWER P…
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL
200									
210									
220									
230									
240									
250									
260									
270									
280									
290									
300									
310									
320									
330									
340									
350	3.5	6.5	3.5	6.5	3.5	6.5			
360	"	"	"	"	"	"			
370	"	"	"	"	"	"			
380	"	"	"	"	"	"			
390	"	"	"	"	"	"			
400	"	"	"	"	"	"			
410	"	"	"	"	"	"			
420	"	"	"	"	"	7.0			
430	"	"	"	"	"	"			
440	"	"	"	7.0	"	"			
450	"	"	"	"	"	7.5			
460	"	7.0	"	"	"	"			
470	"	"	"	7.5	"	"			
480	"	"	"	"	"	8.0			
490	"	7.5	"	"	"	"			
5..	"	"	"	8.0	4.0	8.5			
51.	"	"	"	"	"	"			
52.	"	8.0	4.0	"	4.5	9.0			
53.	"	"	"	8.5	"	"			
54.	4.0	"	"	"	5.0	"			
[illegible]	"	8.5	4.5	"	"	9.5			
5..	4.5	"	"	9.0	5.5	"			
[illegible]	"	9.0	5.0	"	"	10.0			
[illegible]	"	"	"	9.5	"	"			
590	5.0	9.5	5.5	"	6.0	10.5			
[illegible]	"	"	"	10.0	"	"			

NOTES The data shown in this table reflect the following basic minimum requirements:

1. 40 inch minimum separation at pole between neutral or secondary and highest teleph… conductor (These tables do not include any consideration of minimum separation r… quirements when power equipment is mounted on pole below the neutral)
2. 30 inch minimum midspan separation between highest telephone conductor and neutral… secondaries
3. …tae of eight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 3½ feet bel… pole top and phase wires occupying a position at top of pole and lowest secondary… feet below neutral

VERTICAL SEPARATION TABLES FOR TELEPHONE CONDUCTORS ON REA ELECTRIC POLE LINES – Feet	LOADING DISTRICT	POWER CONDUCTOR
When separations are produced or planned use column "L" [illegible] All separations shown are between neutral and telephone conductors.	Light	6 HD Copper TELEPHONE CONDUCTOR All cables weighing 1# or less on 6M strand.

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

SPAN LENGTH FT	All RULING SPAN		RULING SPAN		RULING SPAN		RULING SPAN		RULING SPAN	
	LOADED POWER SAG		LOADED POWER SAG		LOADED POWER SAG		LOADED POWER SAG		LOADED POWER SAG	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200										
210										
220										
230										
240										
250										
260										
270										
280										
290										
300	3.5	6.0								
310	"	"								
320	"	6.5								
330	"	"								
340	"	"								
350	"	7.0								
360	"	"								
370	"	7.5								
380	"	"								
390	"	8.0								
400	"	"								
410										
420										
430										
440										
450										
460										
470										
480										
490										
500										
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The data shown in this table reflect the following basic minimum requirements

1. 40 inch minimum separation at pole between neutral or secondary and highest telephone conductor (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).
2. 30-inch minimum midspan separation between highest telephone conductor and neutral or secondaries
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral

HD-Figure No. 9A

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES - Feet

When secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors

LOADING DISTRICT	POWER CONDUCTOR
Light	4-7/1 ACSR
	TELEPHONE CONDUCTOR All cables 1ng 1# or less on 6M st

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

SPAN LENGTH FT	495 RULING SPAN		650 RULING SPAN		RULING SPAN		RULING SPAN		RULING SPAN	
	LOWER POWER COND		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200										
210										
220										
230										
240										
250										
260										
270										
280										
290										
300	3.5	5.0	3.5	4.5						
310	"	"	"	5.0						
320	"	"	"	"						
330	"	"	"	"						
340	"	"	"	"						
350	"	5.5	"	5.5						
360	"	"	"	"						
370	"	"	"	"						
380	"	6.0	"	"						
390	"	"	"	6.0						
400	"	"	"	"						
410										
420										
430										
440										
450										
460										
470										
480										
490										
500										
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES The data shown in this table reflect the following basic minimum requirements:

1. 40 inch minimum separation at pole between neutral or secondary and highest telephone conductor (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).
2. 10 inch minimum midspan separation between highest telephone conductor and neutral or secondaries
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral.

HD-Figure No.

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES – Feet

LOADING DISTRICT	POWER CONDUCTOR
Light	6A CW
	TELEPHONE CONDUCTOR All cables weighing 1# or less on 10M strand.

If no secondaries are present or planned use column "Secondary". All [illegible]

Span in FT	All [illegible]		[illegible]		[illegible]		[illegible]		[illegible]	
	LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER COND.	
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY
200										
210										
220										
230										
240										
250										
260										
270										
280										
290										
300	3.5	5.0								
310	"	"								
320	"	"								
330	"	5.5								
340	"	"								
350	"	"								
360	"	"								
370	"	6.0								
380	"	"								
390	"	"								
400	"	6.5								
410	"	"								
420	"	"								
430	"	7.0								
440	"	"								
450	"	"								
460	"	7.5								
470	"	"								
480	"	"								
490	"	8.0								
500	"	"								
510	4.0	8.5								
520	"	"								
530	4.5	"								
540	"	9.0								
550	"	"								
560	5.0	9.5								
570	"	"								
580	5.5	10.0								
590	5.5	"								
600										

NOTES: The data shown in this table reflect the following basic minimum requirements:

1. 40 inch minimum separation at pole between neutral or secondary and highest telephone conductor (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral)
2. 30-inch minimum midspan separation between highest telephone conductor and neutral or secondaries
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral.

RD-Figure No. 95

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES – Feet

When secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors.

LOADING DISTRICT: Light

POWER CONDUCTOR: 8A CW

TELEPHONE CONDUCTOR: All cables ing 1# or less on 6M E

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

SPAN LENGTH FT	All RULING SPAN – LOWER POWER COND – NEUTRAL	All RULING SPAN – LOWER POWER COND – SECONDARY	RULING SPAN – LOWER POWER COND – NEUTRAL	RULING SPAN – LOWER POWER COND – SECONDARY	RULING SPAN – LOWER POWER COND – NEUTRAL	RULING SPAN – LOWER POWER COND – SECONDARY	RULING SPAN – LOWER POWER COND – NEUTRAL	RULING SPAN – LOWER POWER COND – SECONDARY	RULING SPAN – LOWER POWER COND – NEUTRAL	RULING SPAN – LOWER POWER COND – SECONDARY
200										
210										
220										
230										
240										
250										
260										
270										
280										
290										
300	3.5	4.5								
310	"	"								
320	"	5.0								
330	"	"								
340	"	"								
350	"	"								
360	"	5.5								
370	"	"								
380	"	"								
390	"	"								
400	"	6.0								
410										
420										
430										
440										
450										
460										
470										
480										
490										
500										
510										
520										
530										
540										
550										
560										
570										
580										
590										
600										

NOTES: The data shown in this table reflect the following basic minimum requirements.

1. 40 inch minimum separation at pole between neutral or secondary and highest telephone conductor (These tables do not include any consideration of minimum separation requirements when power equipment is mounted on pole below the neutral).
2. 30 inch minimum midspan separation between highest telephone conductor and neutral or secondaries.
3. Line of sight rule when secondaries up to 750 volts are involved.
4. All separations are based on REA pole head configurations with neutral 3½ feet below pole top and phase wires occupying a position at top of pole and lowest secondary 3 feet below neutral.

RD-Figure No. 9

TYPICAL SEPARATION TABLES FOR TELEPHONE CONDUCTORS ON REA ELECTRIC POLE LINES

[illegible] are present or planned use [illegible] [illegible] between control and telephone [illegible]

[illegible]	Light
POWER CONDUCTOR	[illegible] Copper
TELEPHONE CONDUCTOR	All cables weighing 1# or less on 10M strand.

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

All RULING SPAN		RULING SPAN		RULING SPAN		RULING SPAN		RULING SPAN	
LOWER POWER COND		LOWER POWER COND		LOWER POWER COND		LOWER POWER COND		LOWER POWER COND	
[illegible]	6.5								
	7.0								
	7.5								
	8.0								
4.0	8.5								
4.5	9.0								
5.0	9.5								
5.5	10.0								
6.0	10.5								
6.5	11.0								
7.0									
	11.5								
7.5	12.0								
8.0									
	12.5								
[illegible]	13.0								
[illegible]	13.5								

The data shown in this table reflect the following basic minimum requirements:
[illegible] minimum separation at pole between neutral or secondary and highest telephone [illegible] (These tables do not include any consideration of minimum separation required where power equipment is mounted on pole below the neutral).
[illegible] minimum midspan separation between highest telephone conductor and neutral or [illegible] secondaries
[illegible] of eight rule when secondaries up to 750 volts are involved.
[illegible] separations are based on REA pole head configurations with neutral 3½ feet below [illegible] top and phase wires occupying a position at top of pole and lowest secondary 3 [illegible] below neutral)

REA-Figure No. 98

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES - Feet

When secondaries are present or planned use column "Secondary". All separations shown are between neutral and telephone conductors

LOADING DISTRICT	POWER CONDUCTOR	TELEPHONE CONDUCTOR
Light	4-7/1 ACSR	A[illegible] weighing 1# or [illegible] strand

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTOR

SPAN LENGTH	595 RULING SPAN — LOWER POWER COND. — NEUTRAL	SECONDARY	650 RULING SPAN — LOWER POWER COND. — NEUTRAL	SECONDARY	RULING SPAN — LOWER POWER COND. — NEUTRAL	SECONDARY	RULING SPAN — LOWER POWER COND. — NEUTRAL	SECONDARY	RUL[ING SPAN] — LOWER PO[WER COND.] — NEUTRAL
200									
210									
220									
230									
240									
250									
260									
270									
280									
290									
300	3.5	6.5	3.5	6.5					
310	"	"	"	"					
320	"	"	"	"					
330	"	"	"	"					
340	"	"	"	"					
350	"	"	"	"					
360	"	"	"	"					
370	"	"	"	"					
380	"	"	"	"					
390	"	"	"	"					
400	"	"	"	"					
410	"	"	"	"					
420	"	"	"	"					
430	"	"	"	"					
440	"	"	"	"					
450	"	7.0	"	7.0					
460	"	"	"	"					
470	"	"	"	"					
480	"	7.5	"	"					
490	"	"	"	7.5					
500	"	"	"	"					
510	"	8.0	"	8.0					
520	"	"	"	"					
530	4.0	8.5	"	"					
540	"	"	4.0	8.5					
550	"	"	"	"					
560	4.5	9.0	4.5	"					
570	"	"	"	9.0					
580	5.0	9.5	"	"					
590	"	"	5.0	"					
600									

NOTES: The data shown in this table reflect the following basic minimum requireme[nts]

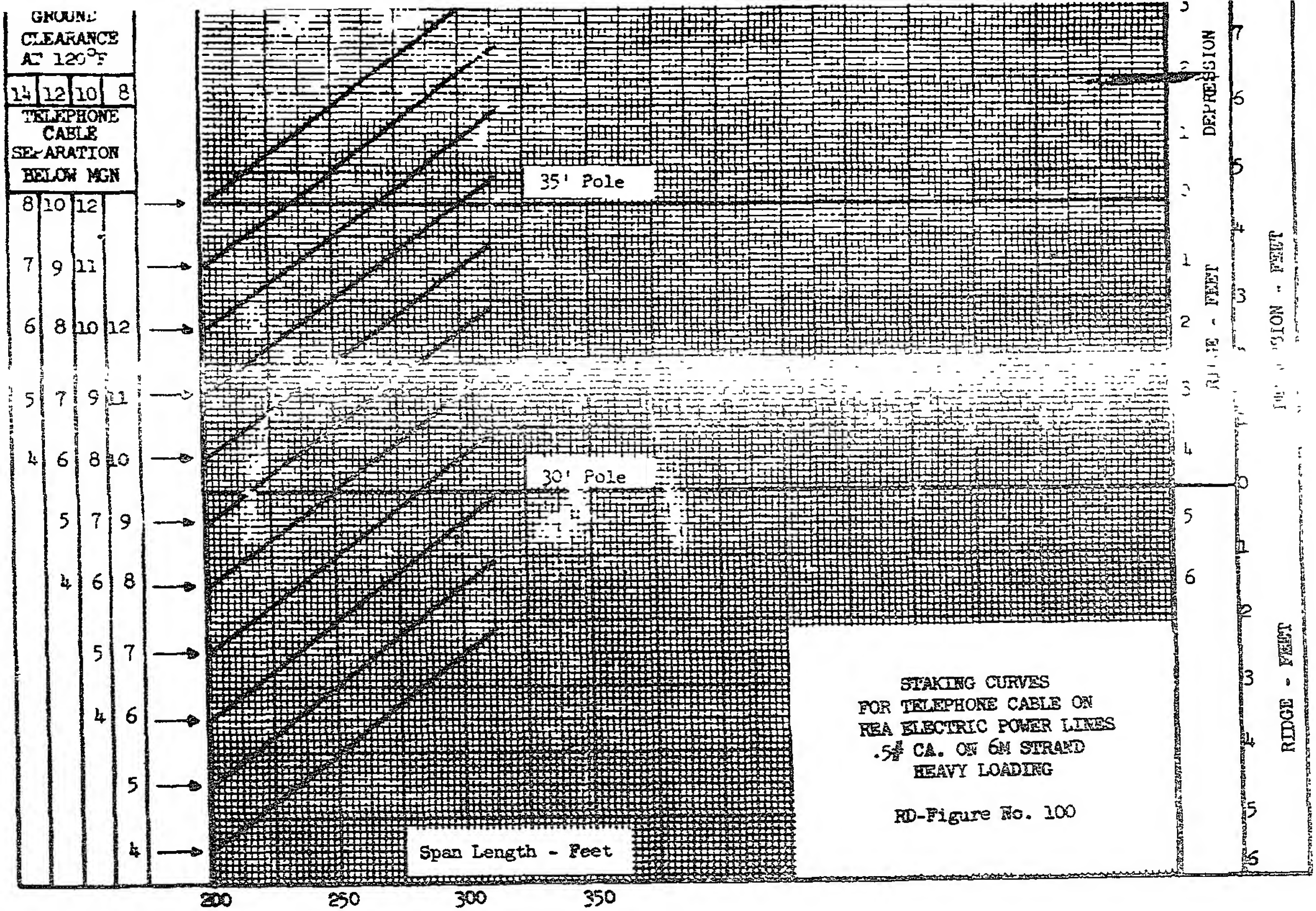
1 40-inch minimum separation at pole between neutral or secondary and highest tel[ephone] conductor (These tables do not include any consideration of minimum separation [re]quirements when power equipment is mounted on pole below the neutral).

2 30 inch minimum midspan separation between highest telephone conductor and neut[ral or] secondaries

3 Line of sight rule when secondaries up to 750 volts are involved.

4. All separations are based on REA pole head configurations with neutral 3½ feet [below] pole top and phase wires occupying a position at top of pole and lowest seconda[ry ...] feet below neutral.

RD-Fi[...]


GROUND CLEARANCE AT 120°F
14 12 10 8
TELEPHONE CABLE SEPARATION BELOW MGN
35' Pole
30' Pole
Span Length - Feet
200
250
300
350
DEPRESSION
RIDGE - FEET
RIDGE - FEET
STAKING CURVES
FOR TELEPHONE CABLE ON
REA ELECTRIC POWER LINES
.5# CA. ON 6M STRAND
HEAVY LOADING
RD-Figure No. 100

LOADING DISTRICT	POWER CONDUCTOR
Light	8A CW
	TELEPHONE CONDUCTOR All ca- ing 1# or less on

VERTICAL SEPARATION TABLES FOR TELEPHONE UNDERBUILD ON REA ELECTRIC POLE LINES - Feet

When secondaries are present or planned, use column "Secondary". All separations shown are between neutral and telephone conductors

MINIMUM SEPARATION AT POLE BETWEEN POWER NEUTRAL AND TELEPHONE CONDUCTORS

SPAN LENGTH FT.	All RULING SPANS		RULING SPAN		RULING SPAN		RULING SPAN		RULING
	LOWER POWER COND.		LOWER POWER COND		LOWER POWER COND.		LOWER POWER COND.		LOWER POWER
	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL	SECONDARY	NEUTRAL
200									
210									
220									
230									
240									
250									
260									
270									
280									
290									
300	3.5	6.5							
310	"	"							
320	"	"							
330	"	"							
340	"	"							
350	"	"							
360	"	"							
370	"	"							
380	"	"							
390	"	"							
400	"	"							
410	"	"							
420	"	"							
430	"	"							
440	"	"							
450	"	"							
460	"	"							
470	"	7.0							
480	"	"							
490	"	"							
500	"	7.5							
510	"	"							
520	"	"							
530	"	8.0							
540	"	"							
550	"	"							
560	4.0	8.5							
570									
580	4.5	"							
590	"	9.0							
600									

NOTES: The data shown in this table reflect the following basic minimum requirements

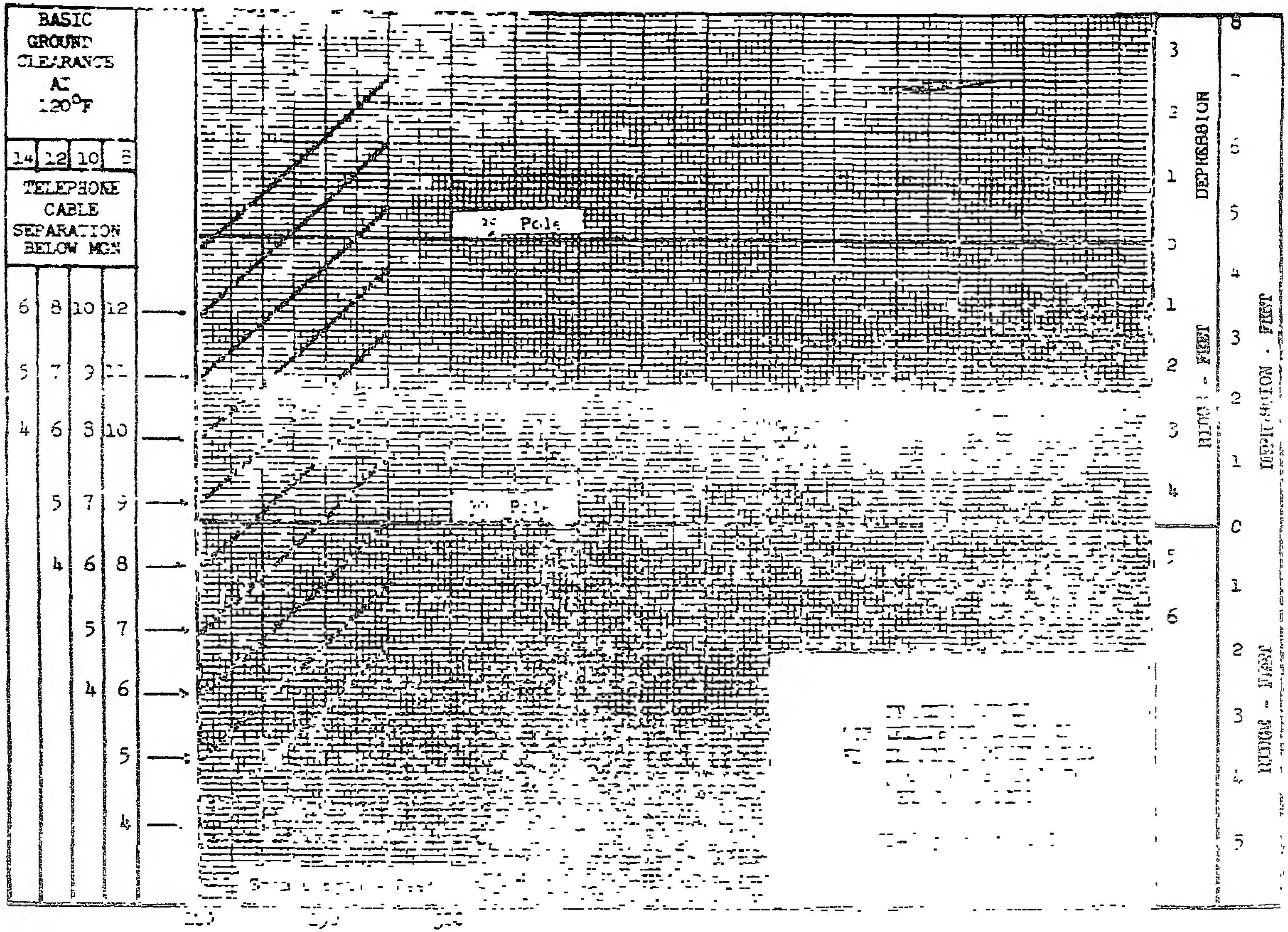
1 40-inch minimum separation at pole between neutral or secondary and highest teleph conductor (These tables do not include any consideration of minimum separation re- quirements when power equipment is mounted on pole below the neutral)

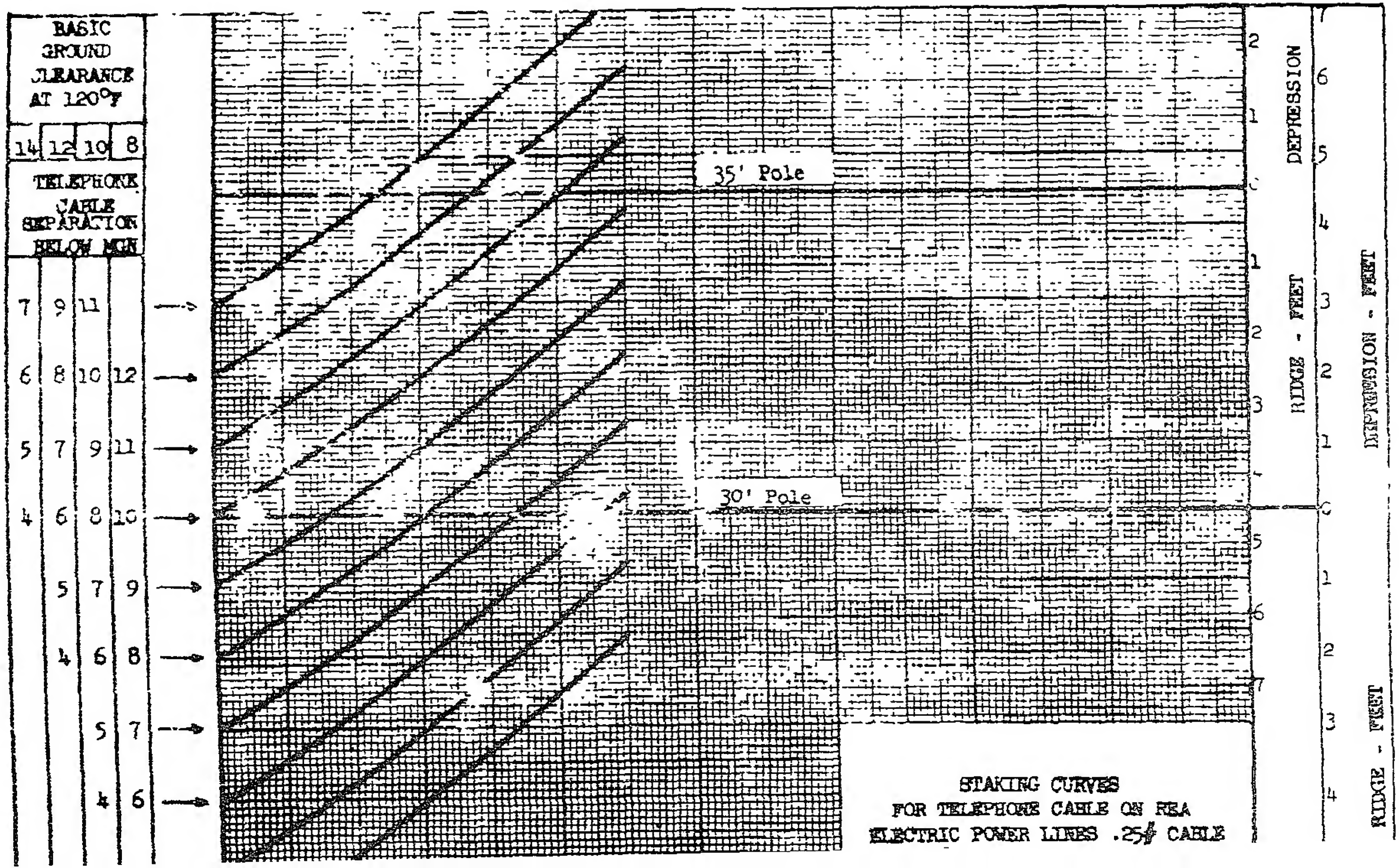
2 30 inch minimum midspan separation between highest telephone conductor and neutral secondaries

3 Lines of sight only when secondaries up to 750 volts are involved

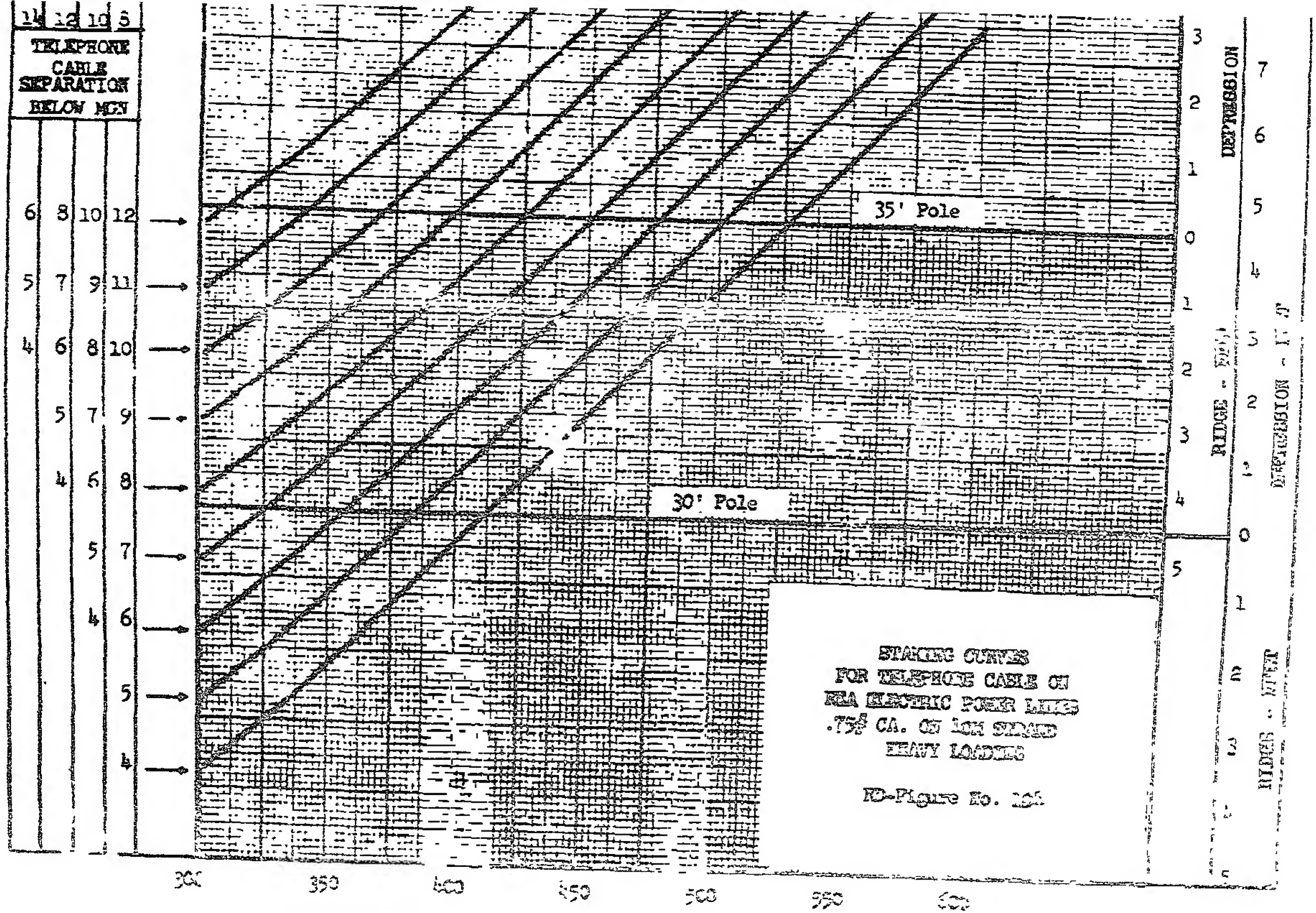
4 All separations are based on REA pole head configurations with neutral 3½ feet bel pole top and phase wires occupying a position at top of pole and lowest secondary feet below neutral.

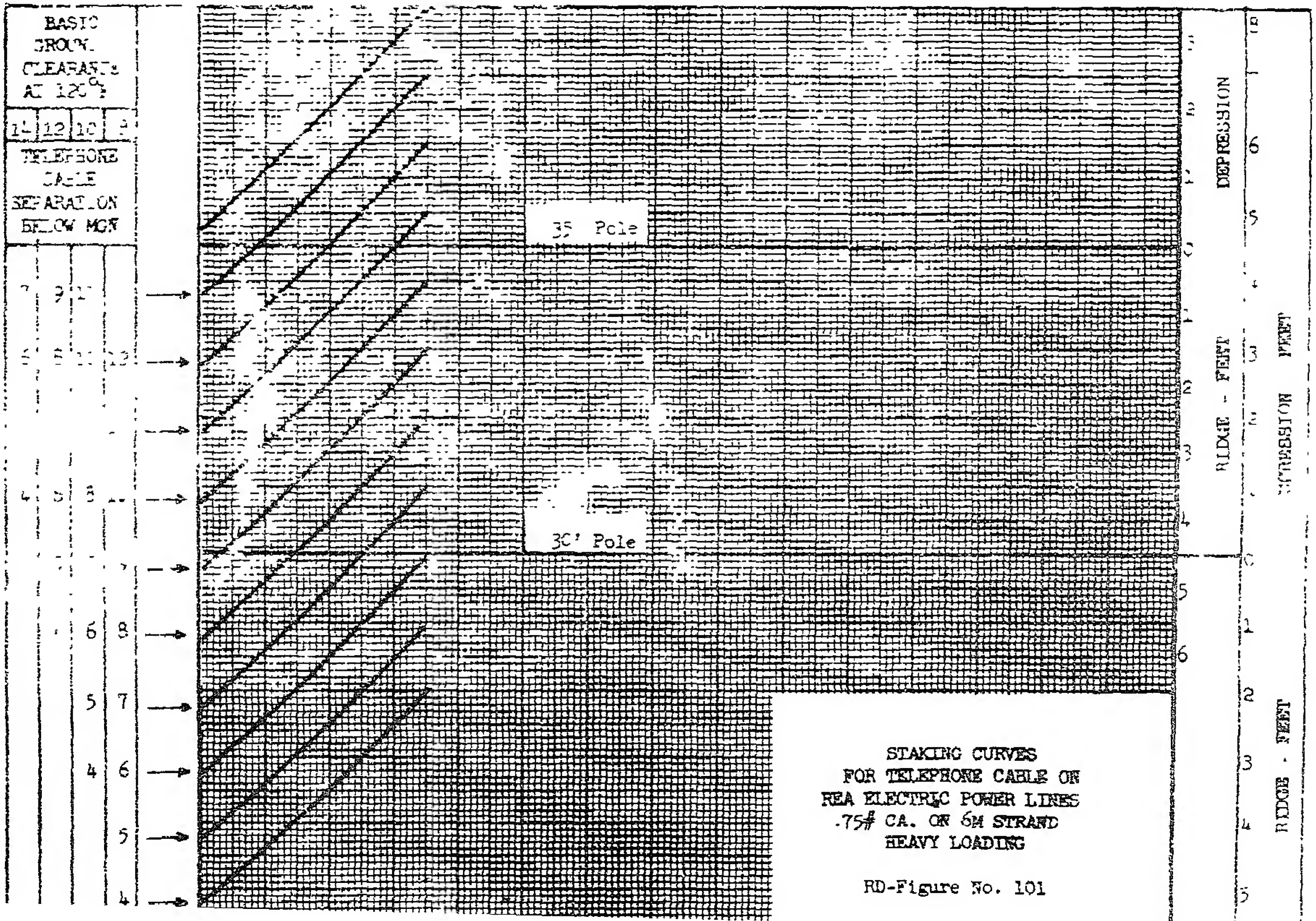
RD-Figur


BASIC GROUND CLEARANCE AT 120°F
14
12
10
8
TELEPHONE CABLE SEPARATION BELOW MGN
Pole
DEPRESSION
RIDGE - FEET
DEPRESSION - FEET
RIDGE - FEET



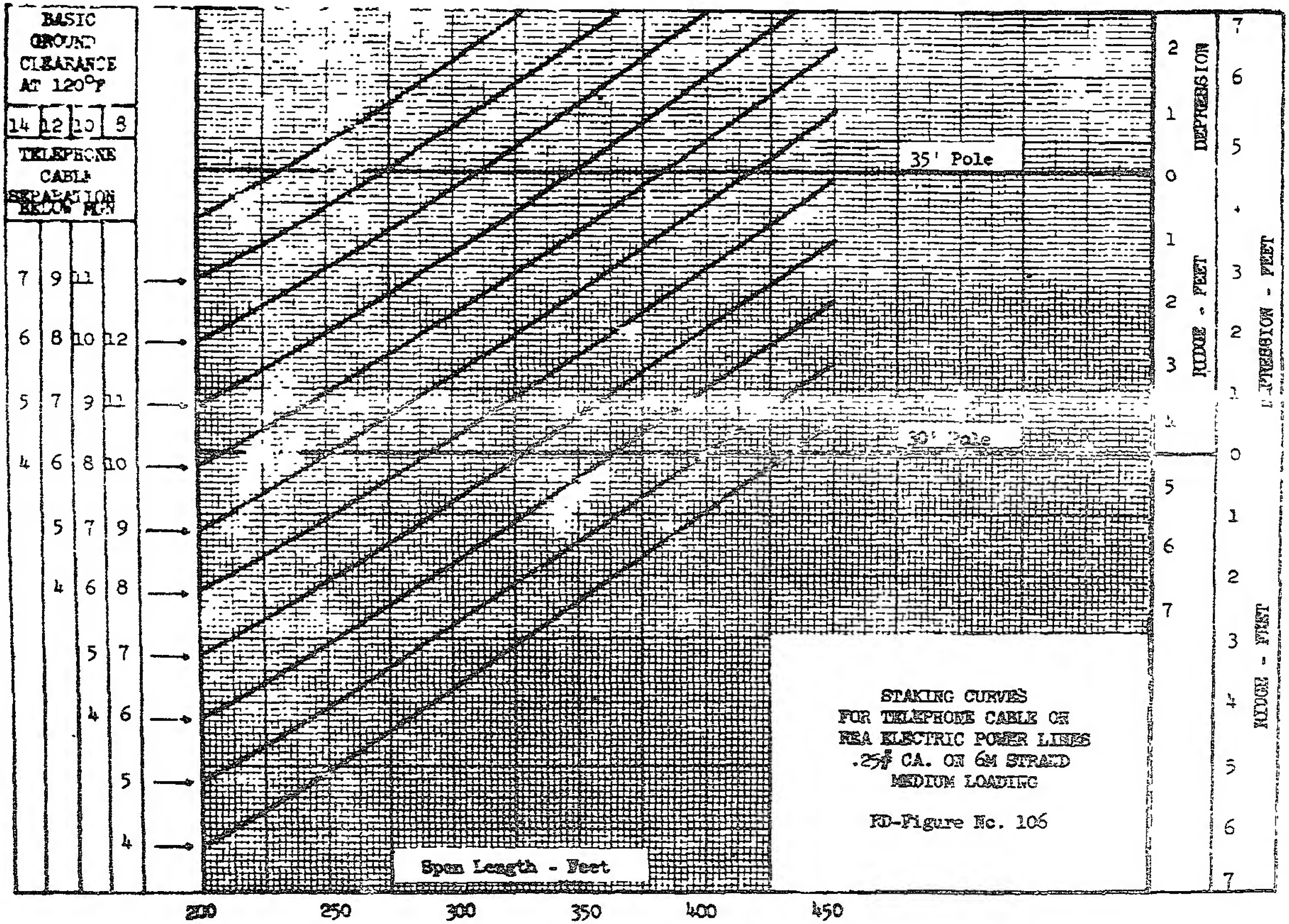
STAKING CURVES
FOR TELEPHONE CABLE ON REA
ELECTRIC POWER LINES .25# CABLE

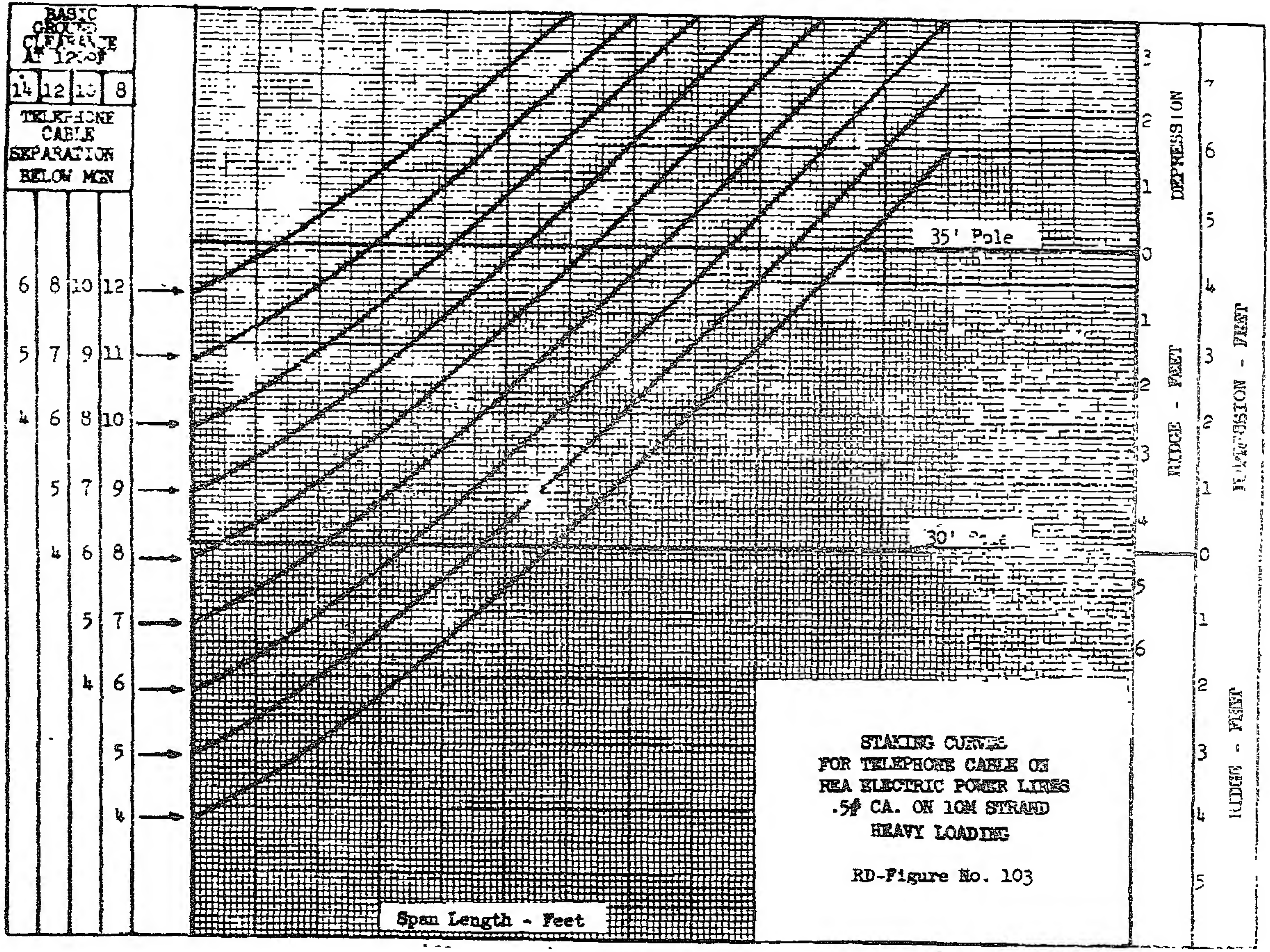

14 12 10 8
TELEPHONE CABLE SEPARATION BELOW MGN
6 8 10 12
5 7 9 11
4 6 8 10
5 7 9
4 6 8
5 7
4 6
5
4
35' Pole
30' Pole
DEPRESSION
RIDGE
DEPRESSION
RIDGE
STAKING CURVES
FOR TELEPHONE CABLE ON
REA ELECTRIC POWER LINES
HEAVY LOADING
300
350
400
450
500
550
600



STAKING CURVES
FOR TELEPHONE CABLE ON
REA ELECTRIC POWER LINES
.75# CA. OR 6M STRAND
HEAVY LOADING

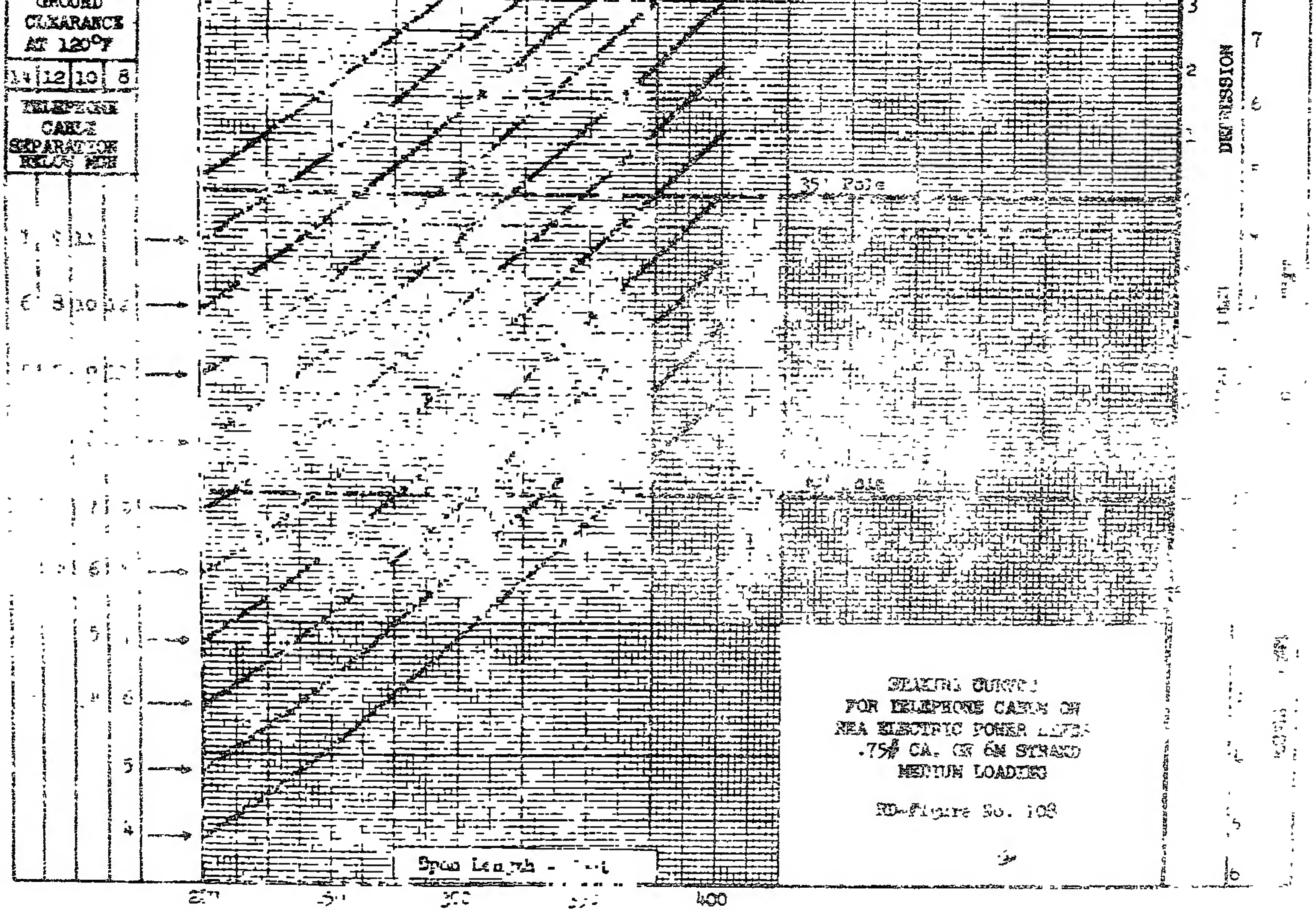
RD-Figure No. 101


BASIC GROUND CLEARANCE AT 120°F
14 12 10 8
TELEPHONE CABLE SEPARATION BELOW MGN
35' Pole
30' Pole
DEPRESSION
RIDGE - FEET
DEPRESSION - FEET
RIDGE - FEET
Span Length - Feet
200 250 300 350 400 450
STAKING CURVES
FOR TELEPHONE CABLE ON
REA ELECTRIC POWER LINES
.25# CA. ON 6M STRAND
MEDIUM LOADING
FD-Figure No. 106



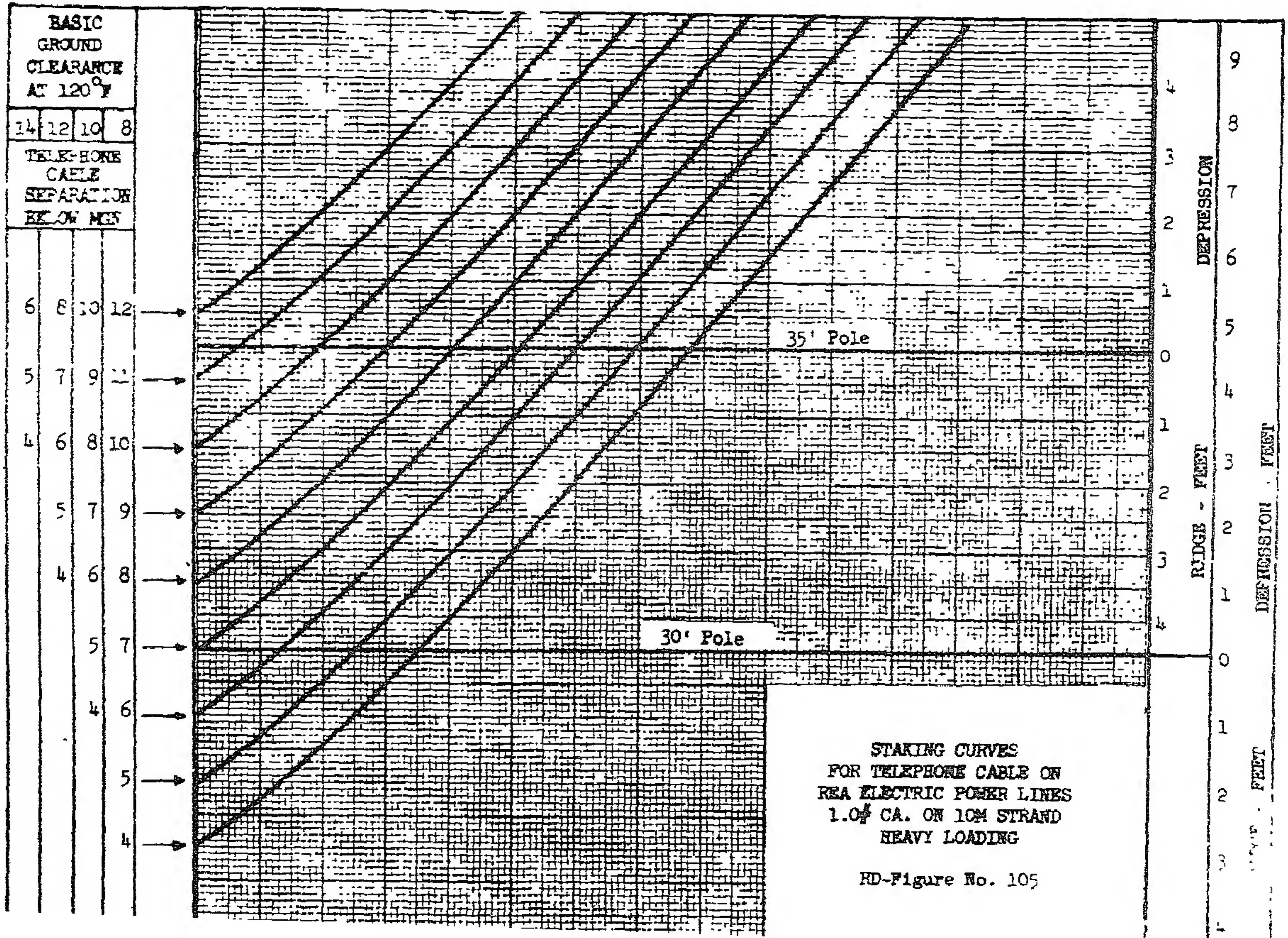
STAKING CURVES
FOR TELEPHONE CABLE ON
REA ELECTRIC POWER LINES
.5# CA. ON 10M STRAND
HEAVY LOADING

RD-Figure No. 103



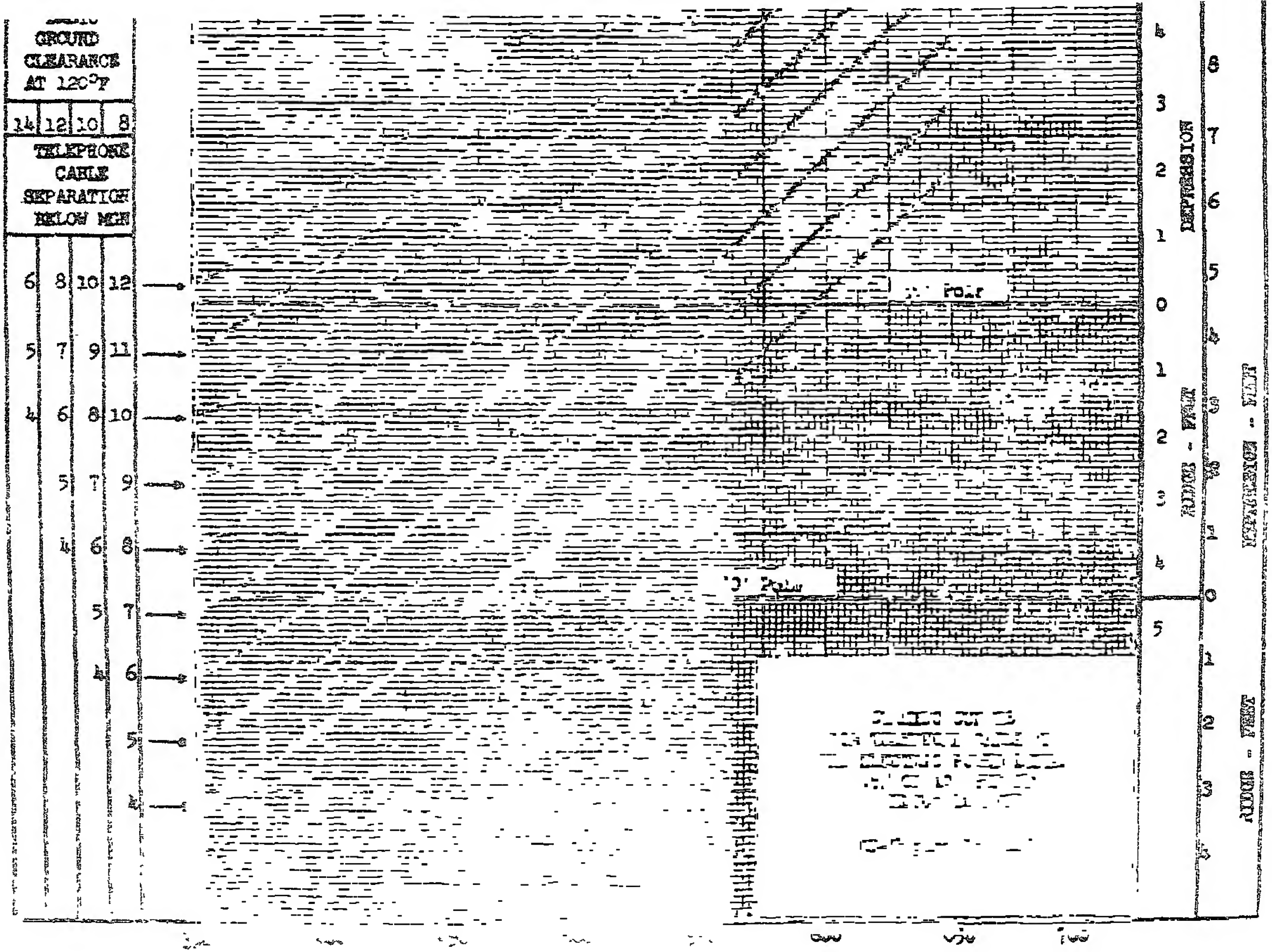
STAKING CURVES
FOR TELEPHONE CABLE ON
REA ELECTRIC POWER LINES
.75# CA. OR 6M STRAND
MEDIUM LOADING

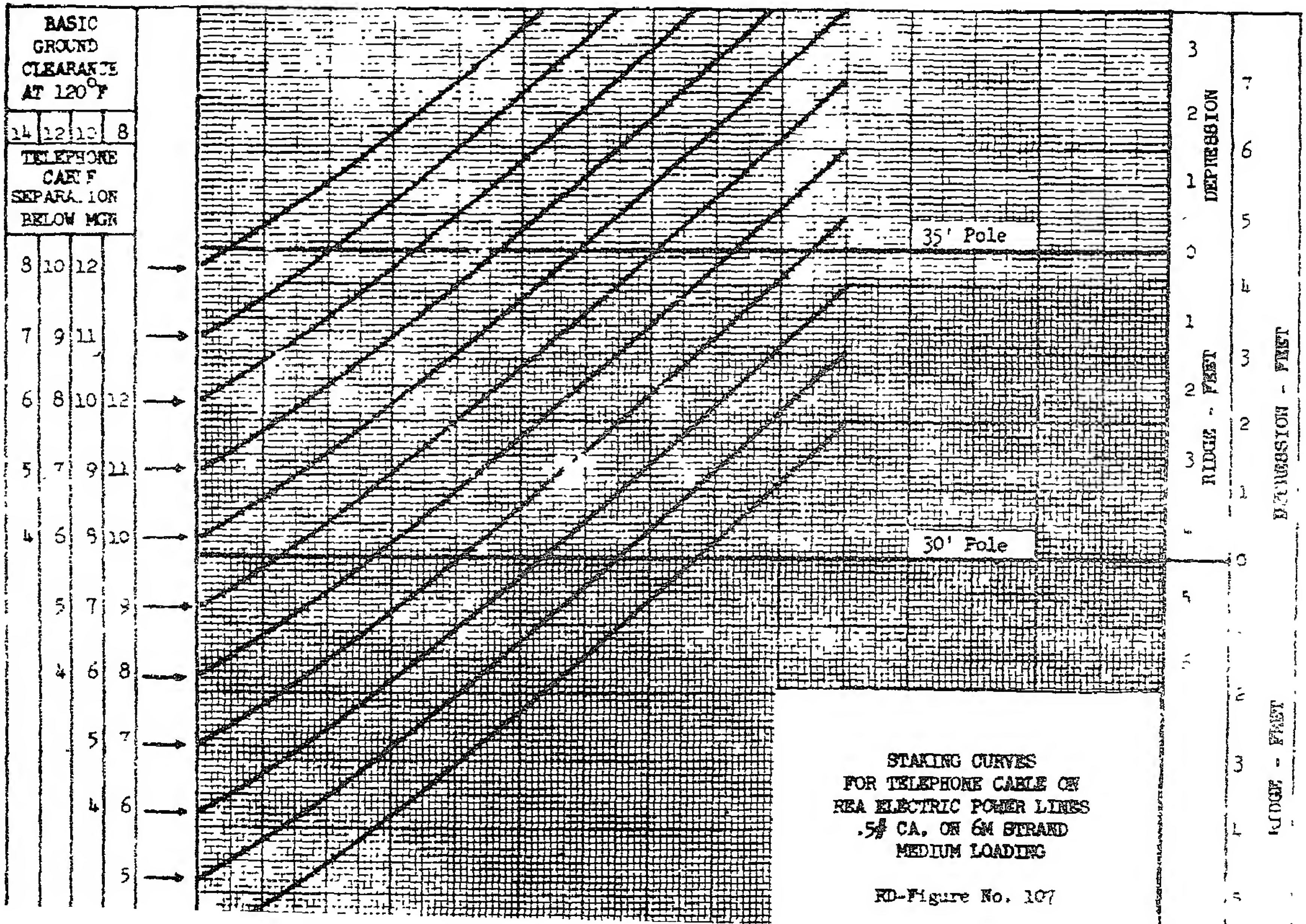
RD-Figure No. 108

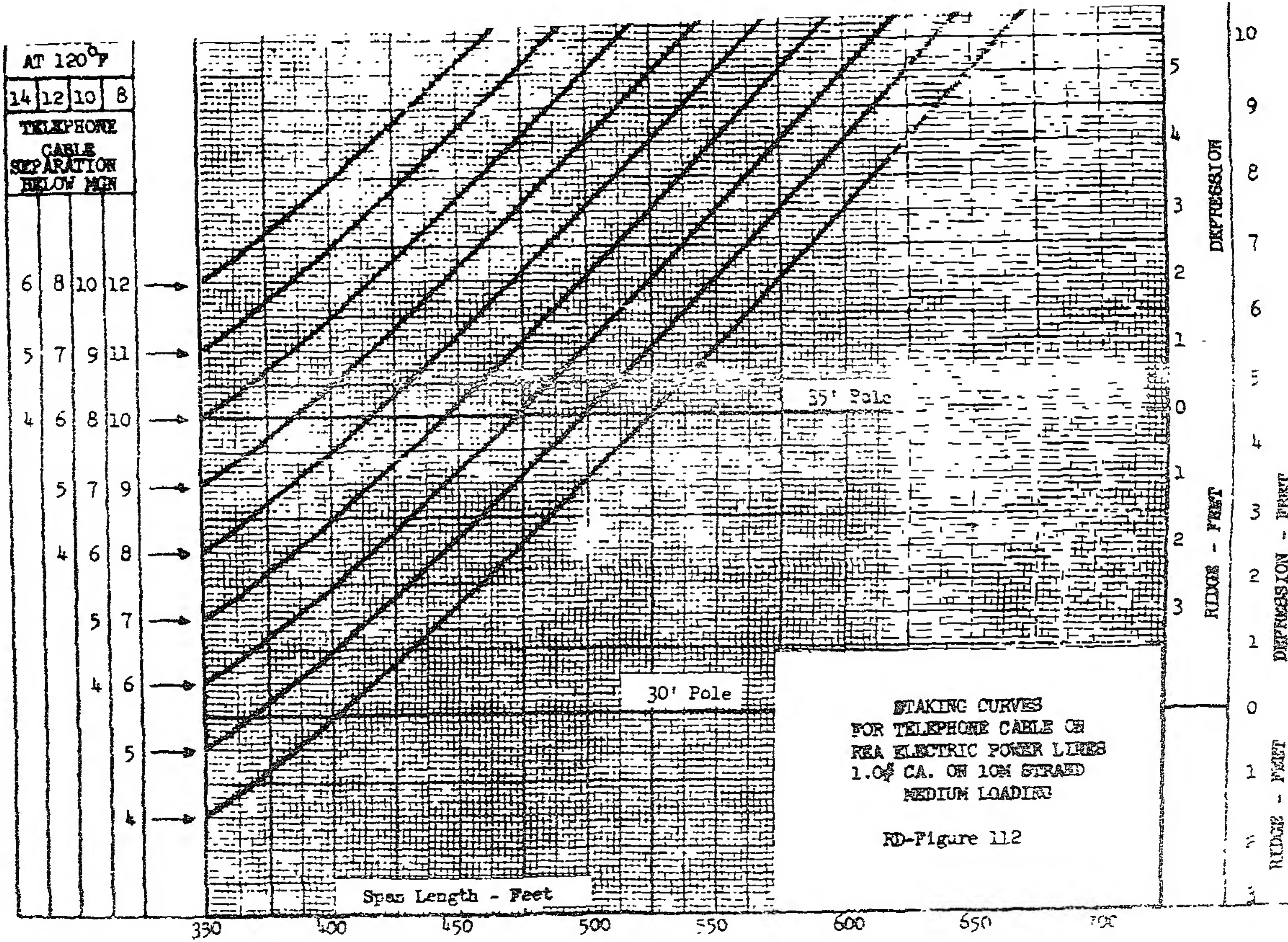


STAKING CURVES
FOR TELEPHONE CABLE ON
REA ELECTRIC POWER LINES
1.0# CA. ON 10M STRAND
HEAVY LOADING

RD-Figure No. 105

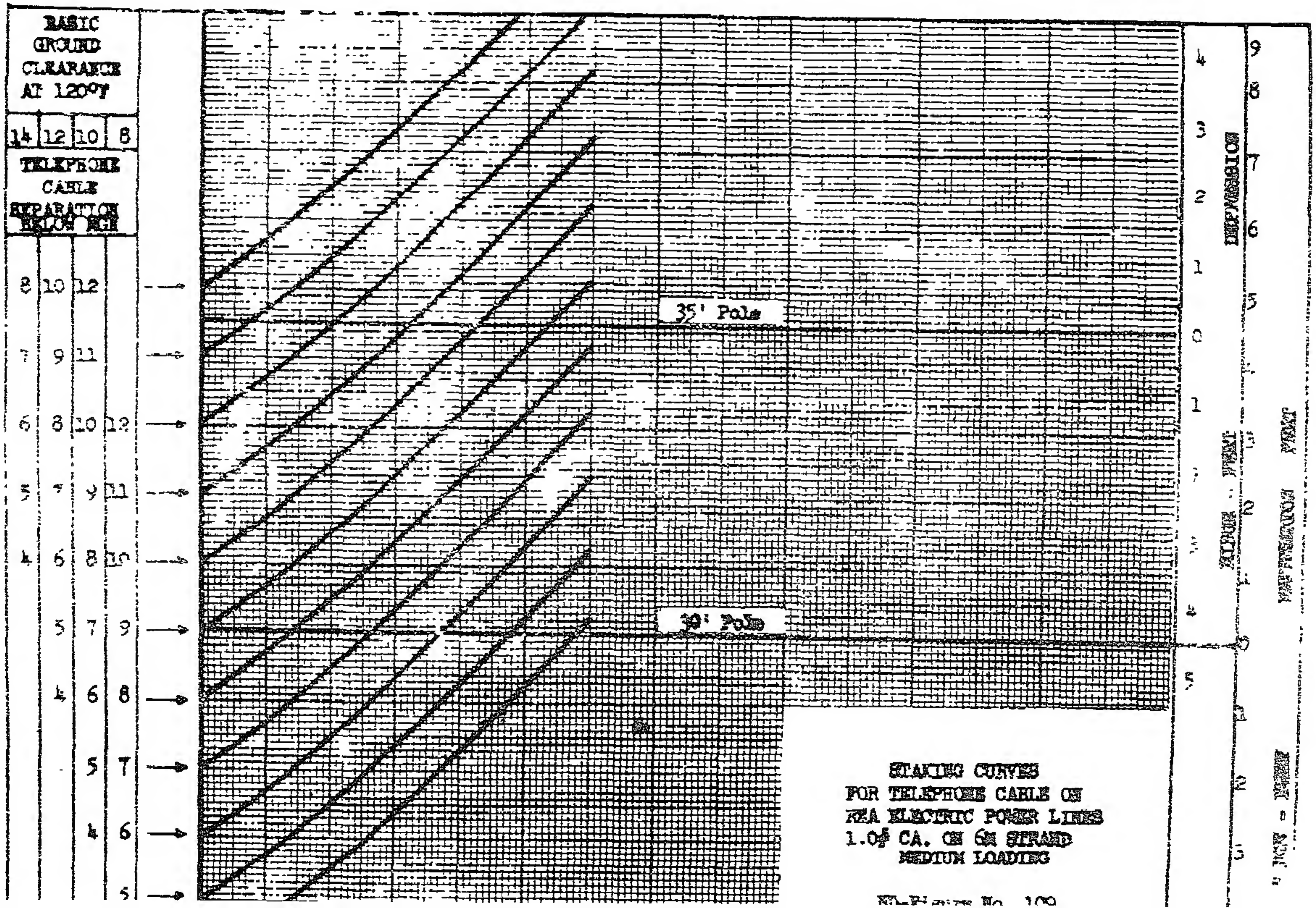

GROUND
CLEARANCE
AT 120°F
14 12 10 8
TELEPHONE
CABLE
SEPARATION
BELOW MGN
DEPRESSION
RIDGE - FEET
DEPRESSION - FEET
RIDGE - FEET

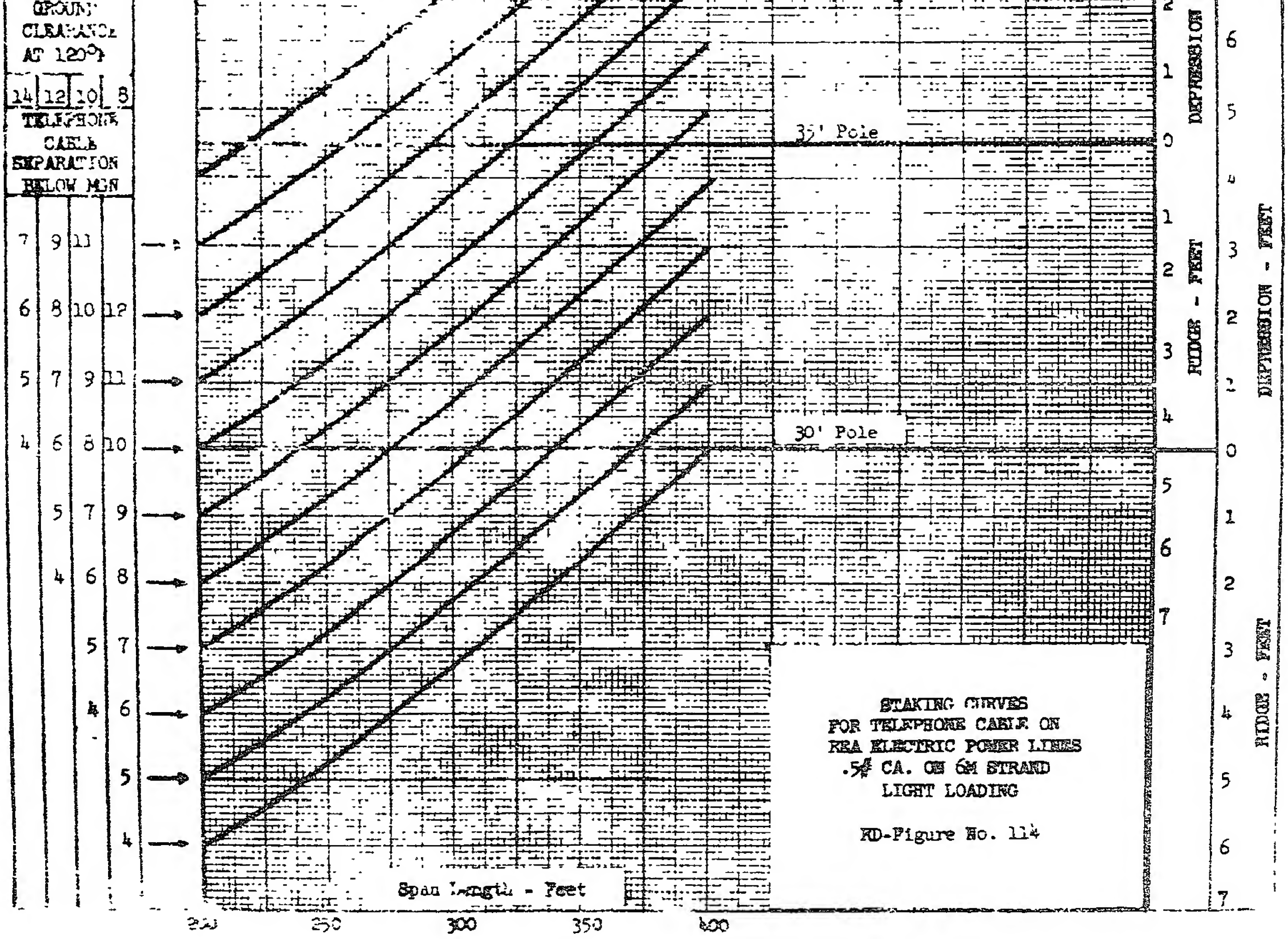

BASIC GROUND CLEARANCE AT 120°F
14 12 10 8
TELEPHONE CABLE SEPARATION BELOW MGN
35' Pole
30' Pole
DEPRESSION
RIDGE - FEET
DEPRESSION - FEET
RIDGE - FEET
STAKING CURVES
FOR TELEPHONE CABLE ON
REA ELECTRIC POWER LINES
.5# CA. ON 6M STRAND
MEDIUM LOADING
RD-Figure No. 107

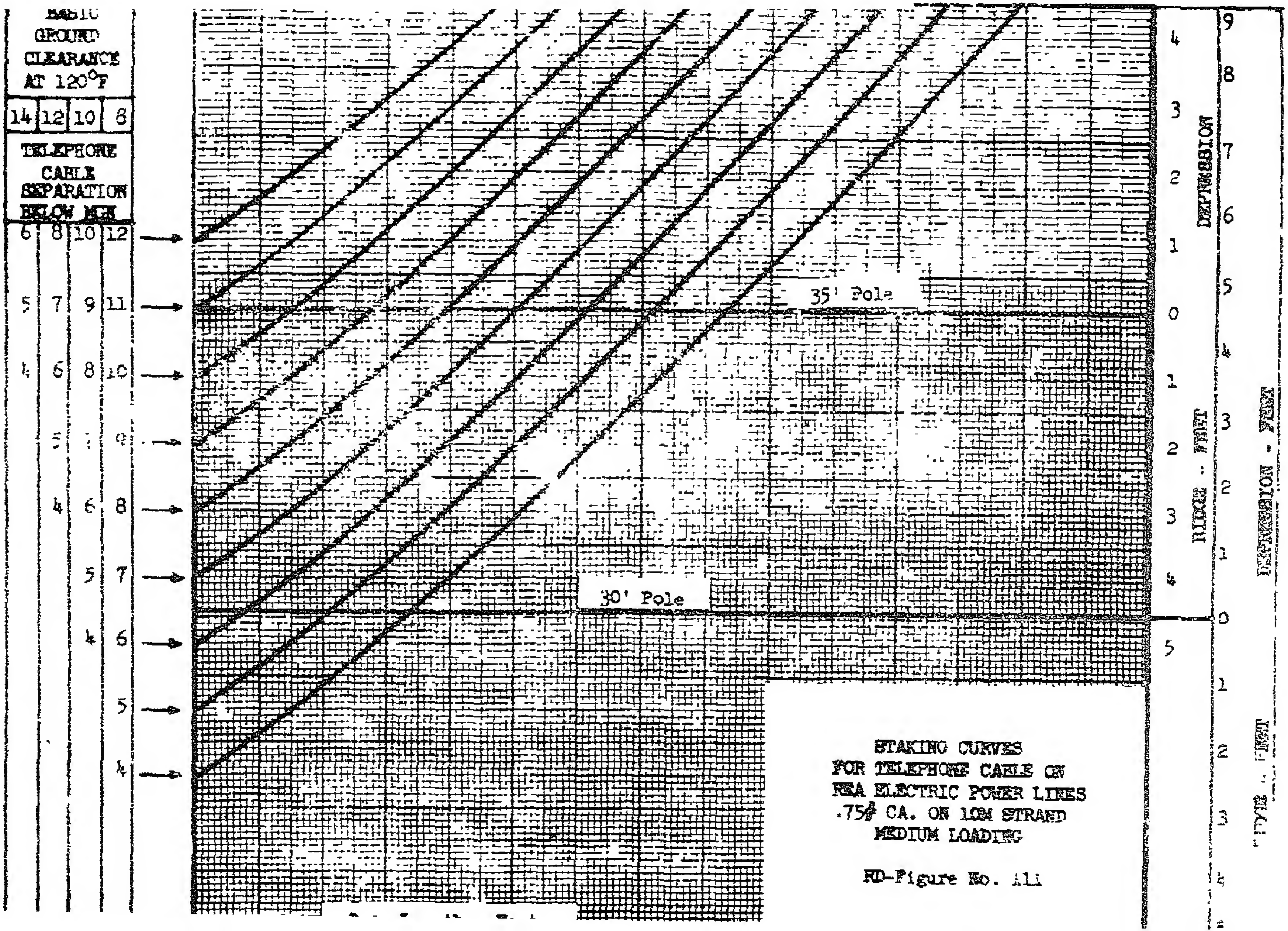


STAKING CURVES
FOR TELEPHONE CABLE ON
REA ELECTRIC POWER LINES
1.0# CA. ON 10M STRAND
MEDIUM LOADING

RD-Figure 112

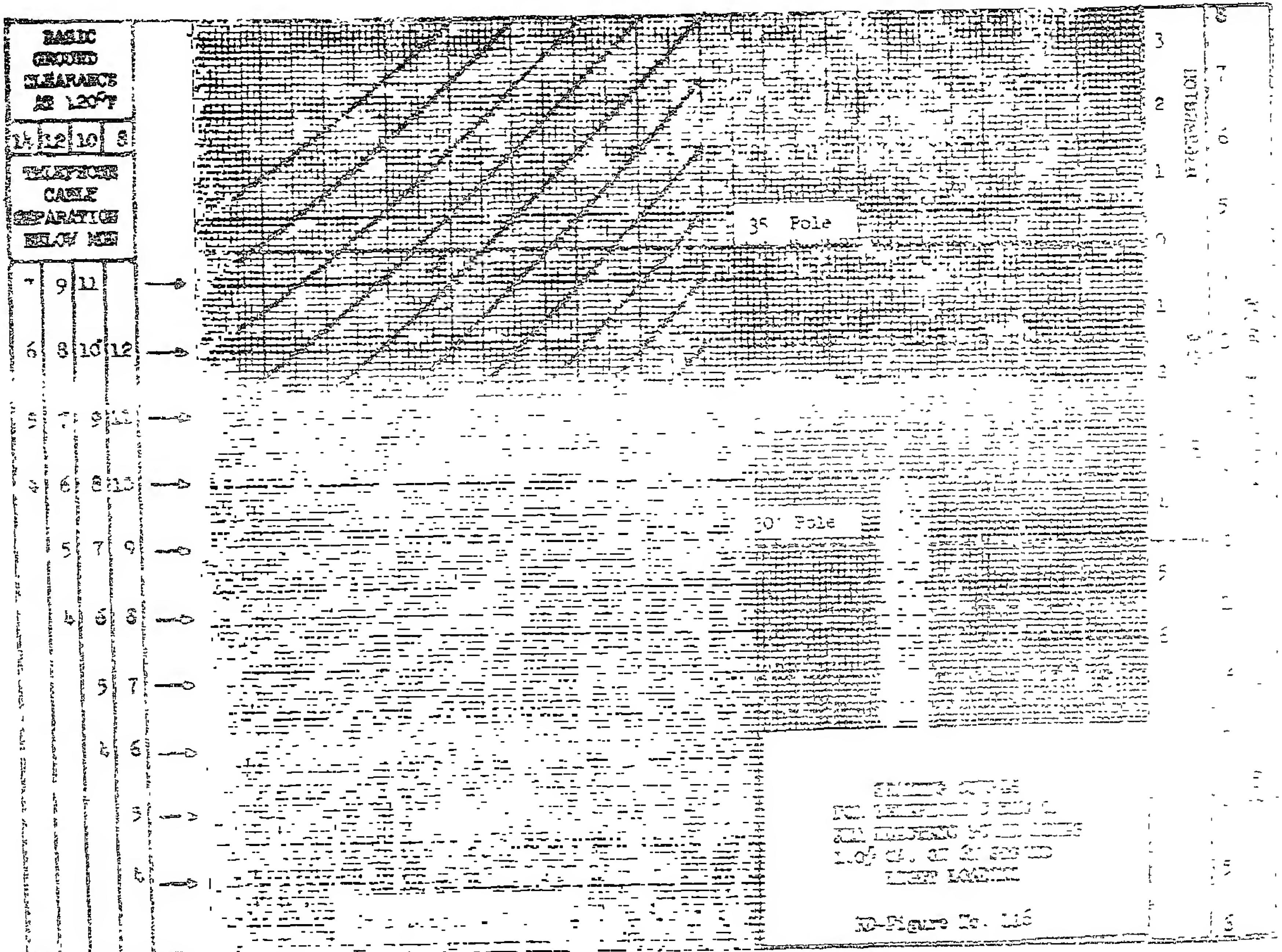

BASIC GROUND CLEARANCE AT 120°F
14 12 10 8
TELEPHONE CABLE SEPARATION
35' Pole
30' Pole
DEPRESSION
STAKING CURVES
FOR TELEPHONE CABLE ON
REA ELECTRIC POWER LINES
1.0# CA. ON 6M STRAND
MEDIUM LOADING

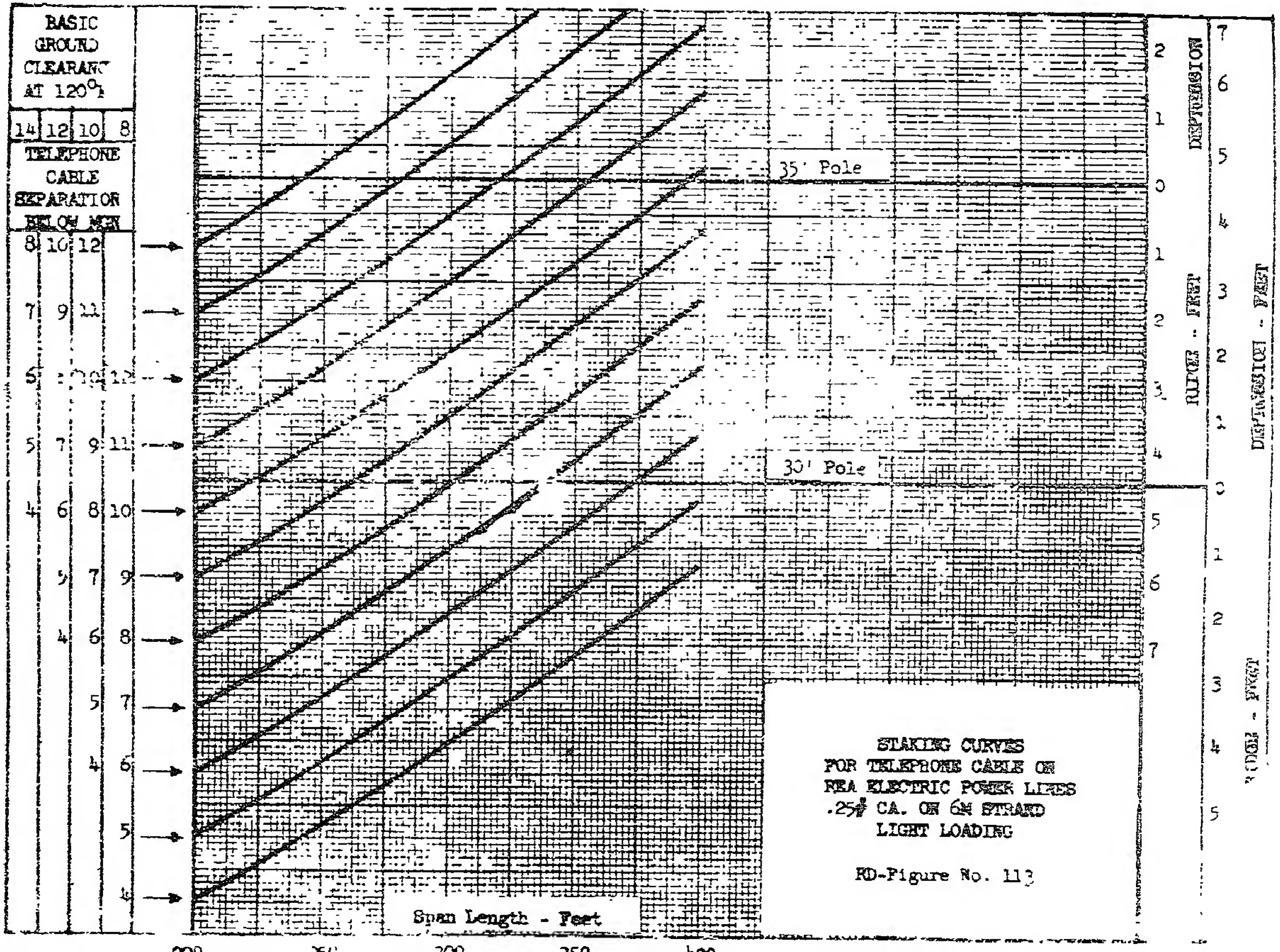

GROUND CLEARANCE AT 120°F
14 12 10 8
TELEPHONE CABLE SEPARATION BELOW MGN
35' Pole
30' Pole
DEPRESSION
RIDGE - FEET
DEPRESSION - FEET
RIDGE - FEET
Span Length - Feet
250
300
350
400
STAKING CURVES
FOR TELEPHONE CABLE ON
REA ELECTRIC POWER LINES
.5# CA. ON 6M STRAND
LIGHT LOADING
RD-Figure No. 114



STAKING CURVES
FOR TELEPHONE CABLE ON
REA ELECTRIC POWER LINES
.75# CA. ON 10M STRAND
MEDIUM LOADING

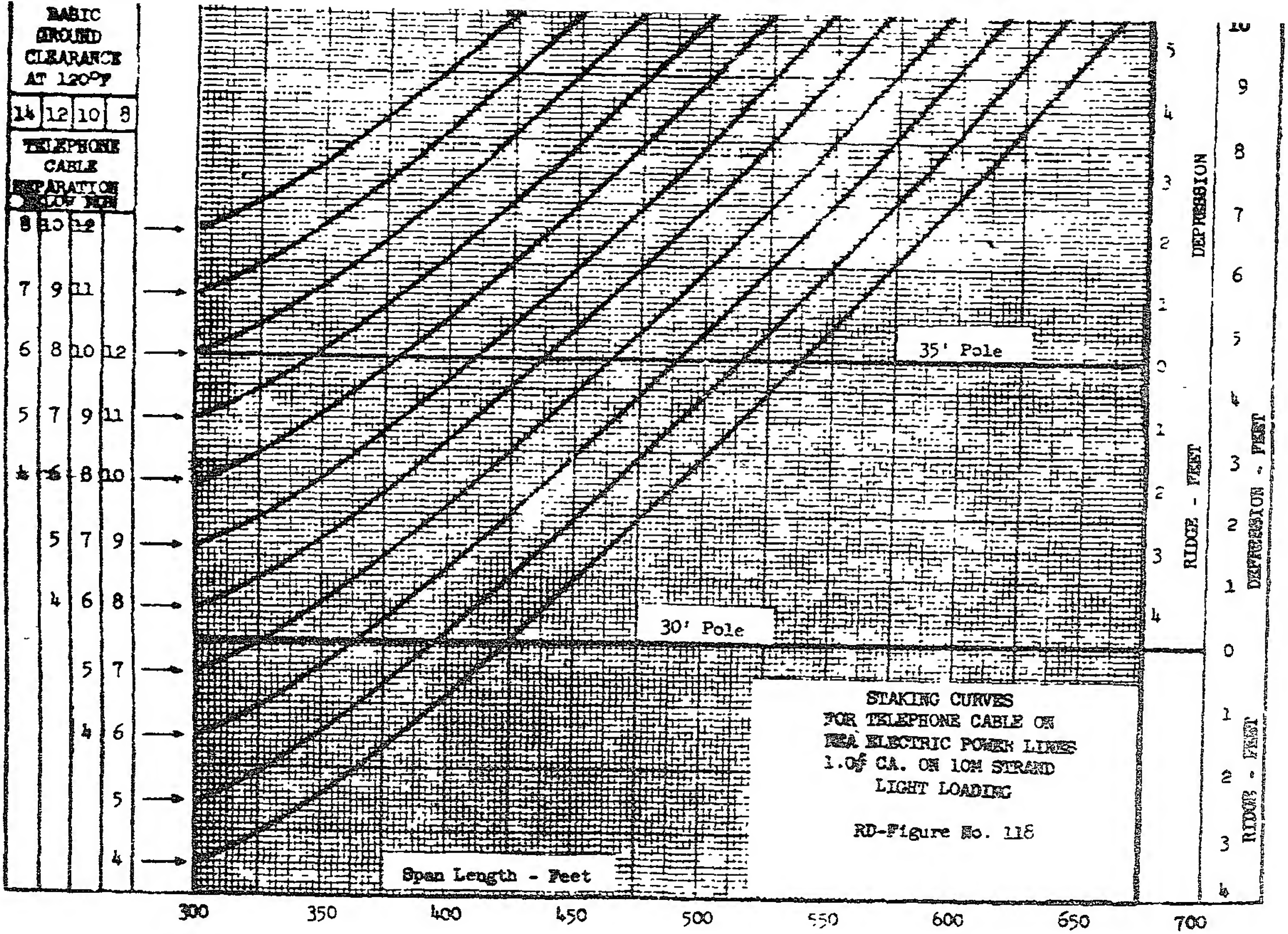
RD-Figure No. 111


BASIC GROUND CLEARANCE AT 120°F
14 12 10 8
TELEPHONE CABLE SEPARATION BELOW NEB
35' Pole
30' Pole



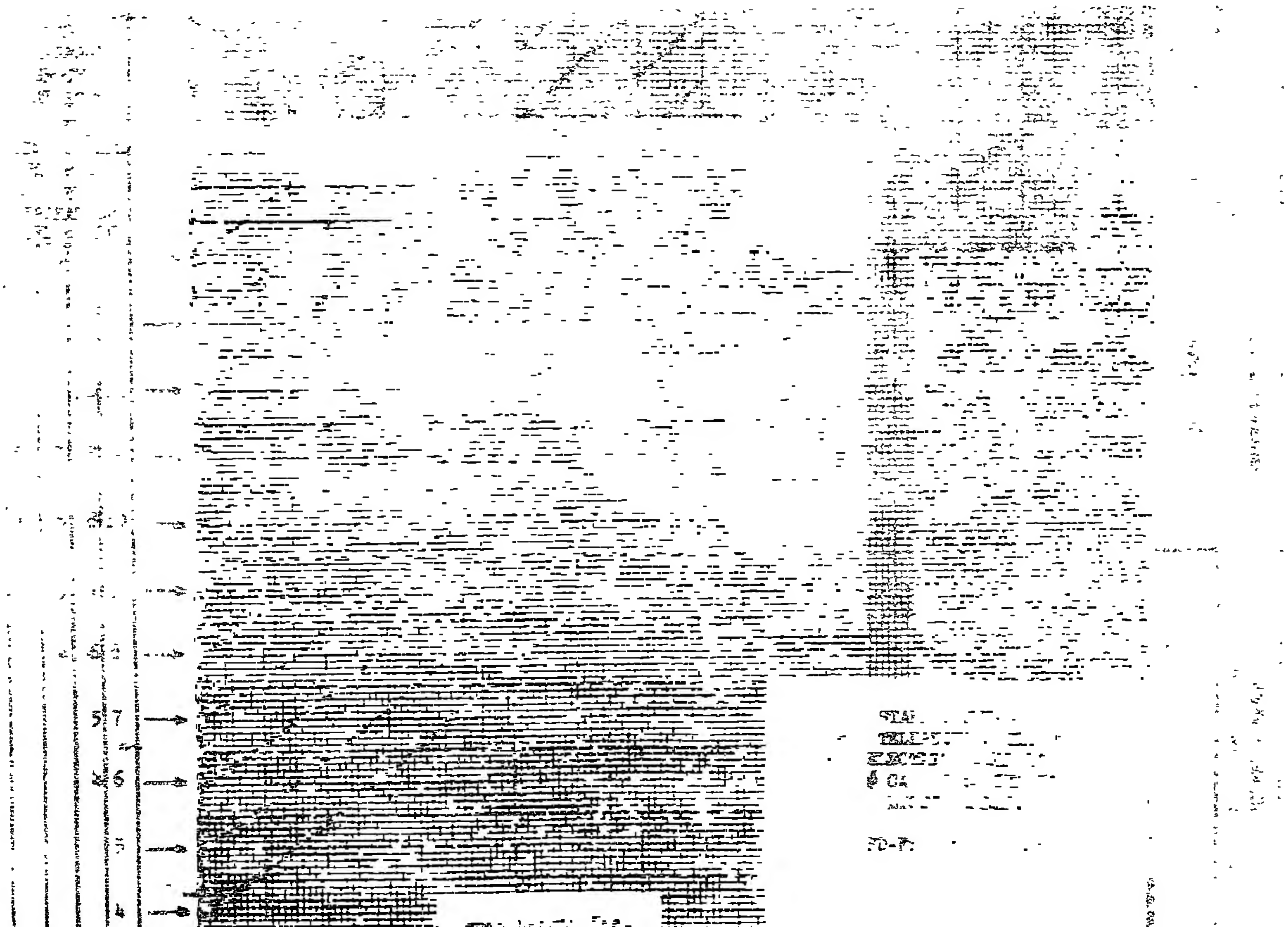
STAKING CURVES
FOR TELEPHONE CABLE ON
REA ELECTRIC POWER LINES
.25# CA. OR 6M STRAND
LIGHT LOADING

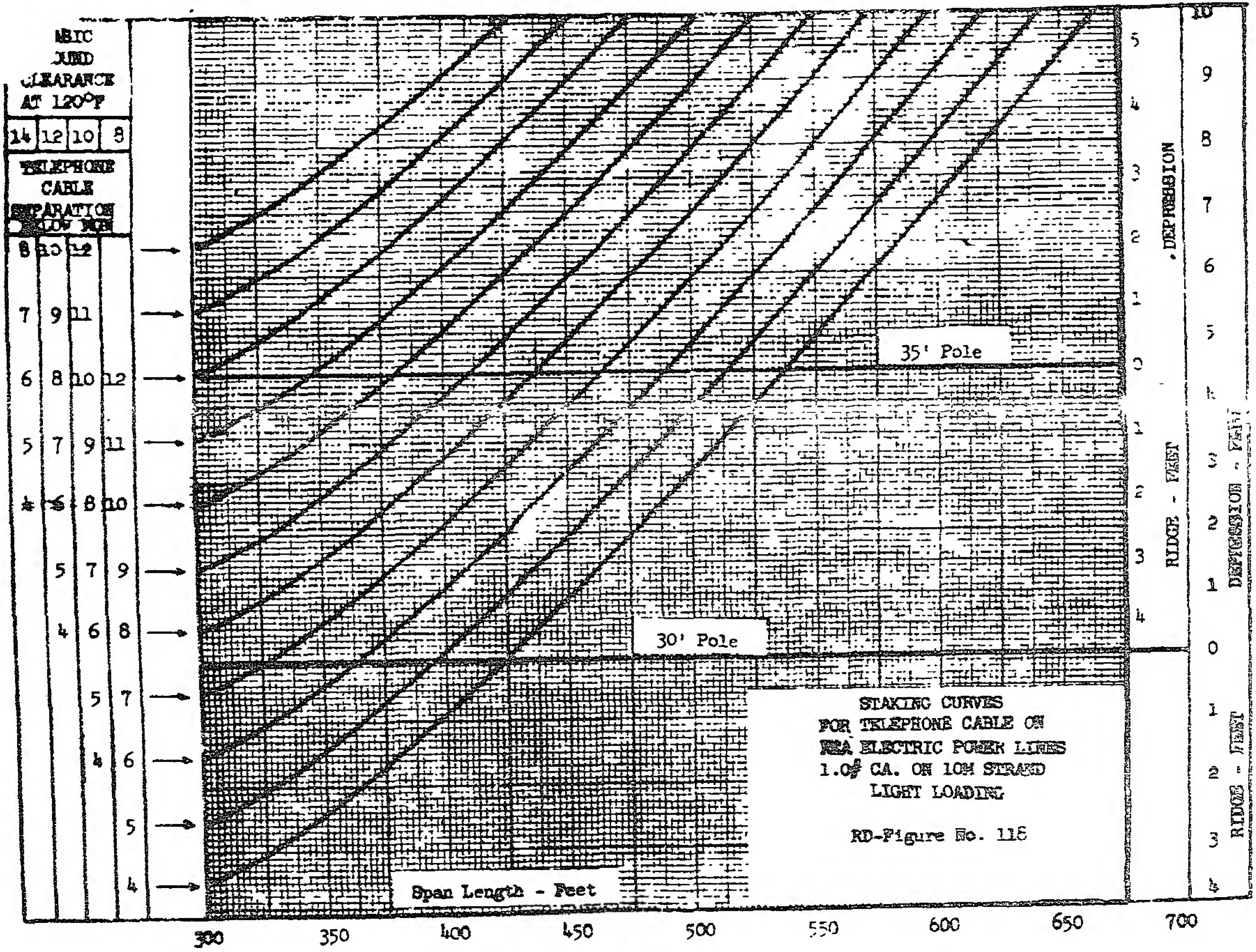
RD-Figure No. 113



STAKING CURVES
FOR TELEPHONE CABLE ON
REA ELECTRIC POWER LINES
1.0# CA. ON 10M STRAND
LIGHT LOADING

RD-Figure No. 118





STAKING CURVES
FOR TELEPHONE CABLE ON
REA ELECTRIC POWER LINES
1.0# CA. ON 10M STRAND
LIGHT LOADING
RD-Figure No. 118
35' Pole
30' Pole
Span Length - Feet
CLEARANCE
AT 120°F
14
12
10
8
TELEPHONE
CABLE
SEPARATION
DEPRESSION
RIDGE - FEET
300
350
400
450
500
550
600
650
700